*Convention Report Issue*

# ELECTRICAL WEST

June 1957
25 Cents

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

The Presidents Speak
Page 113

Things Are Happening Out West
*Picture Presentations*
Page 140

Last Chance to Win $500 in Electrical West's Load Forecasting Contest
Page 205

Flameless electric cooking
keeps more juice in the meat
In roasting, juice is the secret of flavor—and flame is the enemy of juice
Here's why:
◊ Flame needs air to breathe. A flame-heated oven constantly inhales dry air, exhales moist air—literally cooks meat in a hot draft that evaporates good juices. And what is more disappointing than a fine roast without all its flavorful juice?
But when you cook it electrically, there's no draft of constantly changing air. Because there's no flame. You cook in moist, not dry heat. Result? More juice stays in the meat . . . and it tastes better.
◊ And electric cooking is cleaner. Keeps your pots, pans and walls fresh and new. It's far cooler, too. Electricity puts the heat in the food, not in the kitchen. It's fast and automatic. Truly, electricity is the only modern way to cook. See your electrical appliance dealer soon.
Flame
Electric
LIVE BETTER—ELECTRICALLY
SOUTHERN CALIFORNIA Edison COMPANY
Did you know? Flameless electric cooking costs about $1.30 to $1.50 a month for a family of 4

**Edison is selling the advantages of electric cooking— to boost your electric range sales**

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Holman
first!...

...for the best in school, commercial and industrial lighting

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INGLEWOOD, CALIFORNIA

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*service in the west and southwest for all school, commercial and industrial lighting*

# ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

THE ALL-INDUSTRY MAGAZINE OF PROGRESS, ESTABLISHED 1887,
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**Next Month**

An installation of low-cost underground in a large home area at San Diego and one of the first uses of microwave relaying—by Public Service of New Mexico—will be Engineering features. In Market Development there will be a report on an outstanding "Whopper" campaign. Coming up are details of studies that led to Washington Water Power's promotion of electric heating.

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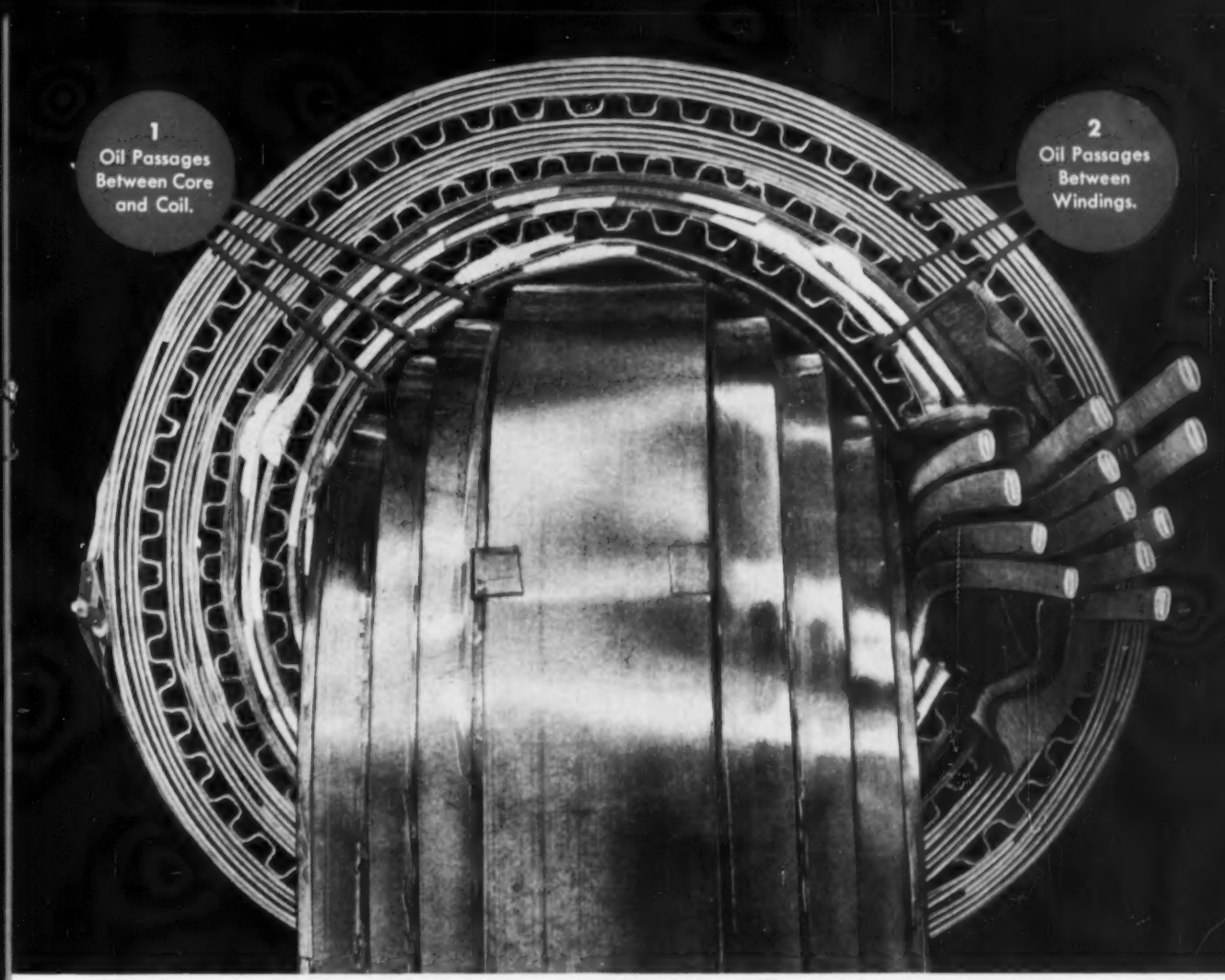



L-M Round-Wound Transformers have natural oil passages between cruciform core and round coil **(1)** to help dissipate heat from the coils more rapidly. In addition, ducts provided by spacers placed between windings **(2)** and between layers in most sizes provide additional oil circulation.

# Why More Customers Are Selecting L-M Round-Wound® Transformers

Many factors enter into transformer selection. Here are some of the reasons for the great increase in customer preference for L-M's obround-shape Round-Wound transformers.

**Balanced Performance:** The core is a continuous wound strip of oriented steel. Coils are wound directly onto this core. Since the core is not cut, unwound, or disturbed in any way after annealing, there are no air gaps to break up the flux. This results in low exciting current and core loss.

The wound-core, round-coil design permits fewer winding turns and smaller turn diameter. This results in low impedance, and provides better regulation at all power factors.

**Higher Uniform-Impulse Level:** Round coils are wound into shape. Therefore, insulation is not damaged by malleting into rectangular shape. Coils have longer creepage distance between windings and between leads.

**Higher Short-Circuit Strength:** Round coils are not stressed out of shape under high radial short-circuit forces. Strong steel frame, heavy clamping bolts, sturdy maple blocks and varnished coils prevent axial movement.

**Higher Short-Time Overload Capacity:** Round coils and the cruciform cross-section core expose large surfaces to cooling oil. The result is relatively low hot-spot temperatures, which add considerably to high short-time overload capacity.

**Additional Capacity on Pole:** L-M's new obround tank design makes the unit smaller and lighter, with shorter moment arm from the pole. This combination reduces bending moment on the pole and crossarms, and thus greatly increases potential capacity of existing transformer structures.

### Get Complete Information

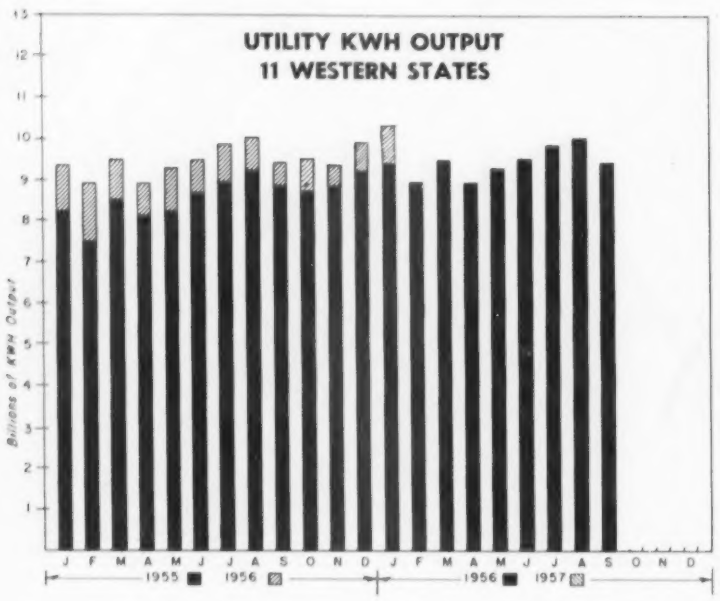
Ask your L-M Field Engineer for complete information and bulletins on L-M's Round-Wound Transformers. Or write Line Material Company, Transformer Division, Zanesville, Ohio.

256-R

**LINE MATERIAL**

McGRAW-EDISON COMPANY

# ----How're We Doing?




## Plan With Confidence

Long-range capital expenditures by industry will be maintained at a very high level through 1960. This reassuring news comes as a result of a periodic national survey made by the McGraw-Hill Department of Economics, which indicates the rate of spending for industrial expansion and modernization will continue at around $36 billion annually. Spending of this magnitude is a big key in the over-all economic prosperity of the country. The record spending rate of 1956 will be topped by 12% during 1957. **The survey reveals specific advanced plans for the 1958-60 period at a rate comparable to that of 1956.**

## Sales Forecast

**Company sales forecasts indicate that a 26% increase in volume is expected by manufacturing as a whole by 1960. At that time 10% of the sales volume will represent products that are not now being made. Expenditures for research and development of new products, which reached $6.1 billion in 1956, is expected to go up to, at least, $9.3 billion in 1960. Research and development programs of the manufacturing companies will require 7% more scientists and engineers than they employ in 1957 and by 1960 they will need an additional 15% increase.**

## Expansion Vs Modernization

In 1957 capital spending will be divided as follows: 52% for expansion and 48% for modernization. In the plans for the three following years, this ratio will be almost exactly reversed with modernization scheduled to take 53% of the total capital spending budget. While these figures are a report, not a forecast, of industry planning, they do reflect confidence and optimism concerning the immediate future. The increasing heavy emphasis on replacement and modernization, combined with the forecasts of output, foretell heavy increases in the use of electrical energy per man-hour in the future.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**ALL HE'S CHECKING IS WHAT'S ON THE REELS —NOT THE REELS THEMSELVES.** These convenient one-way reels are now available with Rome's building wire, Triplex SD, and line wire.

# There's no need to keep track of these one-way reels . . . they're non-returnable

## *Now available in all bldg. wire through 500 MCM, Triplex SD, and line wire*

The non-returnable reel—first adopted as a standard by Rome Cable—gets rid of many of your recording, reshipping, and inventory headaches. Here are some of the ways it benefits you:

**Eliminates bookkeeping costs.** You avoid the extra paper work brought on by billing, crediting, and storing of returnable reels.

**Saves storage space.** When the wire or cable is used up, you simply destroy the reel or throw it away.

**Handles easier.** Rome's non-returnable reel is lighter to handle than an ordinary reel—yet sturdy and quite adequate for normal service.

All these benefits are now available to you with all Rome's building wire through 500MCM, Triplex service drop cable, and line wire.

Be sure to consider the advantages of Rome's standard non-returnable reel package when you place your next wire or cable order. Contact your nearest Rome Cable representative for more information—or write to Dept. 139, Rome Cable Corporation, Rome, N. Y.

**ROME CABLE**

CORPORATION

*Photos by Robert Yarnall Richie*

# Rome's station control cable installed

**Artist's Sketch** of first U. S. full-scale atomic-electric plant. This revolutionary power plant—under the operation of Duquesne Light Company of Pittsburgh—will be delivering electricity to home and industry in the Pittsburgh area late this year or early next.

**Atomic-Electric Power** will be controlled from this large cabinet installation at the Shippingport atomic power station. Nearly ten miles of Rome's highest quality station control cable were used in this vital system.

**Partner to the Atom.** Rome's control cable is here being installed in the nation's first major atomic power plant at Shippingport, Pennsylvania. Rome Cable furnished over 50,000 feet of station control cable for this important installation.

# in Shippingport atomic power station

This country's first full-scale atomic power plant for the generation of electricity will contain almost ten miles of Rome's highest quality station control cable.

The selection of Rome's Rozone-Roprene cable—with a special over-all asbestos outer braid—for this epoch-making installation was no accident, for individual Rozone insulated-Roprene jacketed conductors represent the ultimate in control cable design and performance.

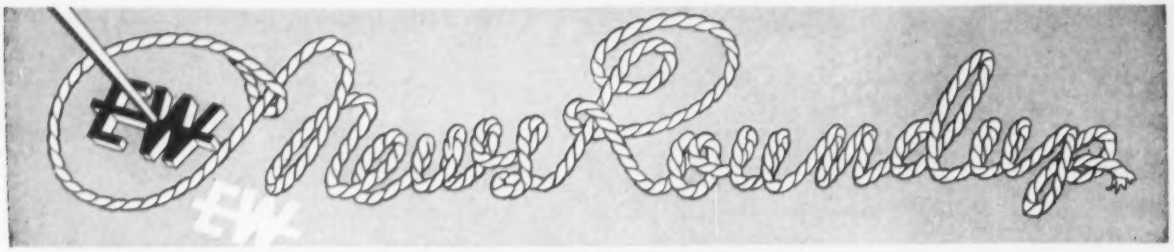
**Advantages of Rozone insulation.** Rozone—a high-quality oil-base compound—is an excellent insulation. Long and widespread experience has proved that its high-dielectric and impulse strength, combined with its resistance to corona and ozone cutting, makes it an ideal insulation for control and high-voltage power cables. Its electrical properties are practically unaffected by long-time immersion in water or burial in the ground.

**Advantages of Roprene jacket.** Roprene—a neoprene synthetic rubber compound developed by Rome Cable—provides an extremely durable and permanent mechanical protective covering for the individually Rozone-insulated conductors. It assures terminations that are resistant to abrasion, weather, and attack by chemicals and oils. And it is exceptionally resistant to fire.

Additional fire protection for this particular cable included a special over-all asbestos outer braid.

Specify premium-quality Rozone-Roprene control cable for your next job. Contact your nearest Rome Cable representative for more information—or write to Department 802, Rome Cable Corporation, Rome, New York.

**ROME CABLE**
CORPORATION




**SIGNIFICANT ITEMS FROM THE EDITOR'S NOTEBOOKS**

**ATOM CONFLICT** — Democrats in Congress are girding for a battle to get the Gore Bill passed this session. That's the bill calling for a $100,000,000 program of federal power reactor construction. As frosting for the cake, they want the reappointment of AEC Commissioner Thomas E. Murray, whose term expires June 30 and who has been the democratic pipeline out of AEC's interworkings.

Pressure will be applied by the Gore Bill supporters who think they are strong enough to (1) disapprove all AEC's appropriation requests, (2) refuse the confirmation of any nominee by President Eisenhower for the commission vacancy left vacant by the death of Dr. John Von Neumann, (3) keep the badly needed Federal Atom Insurance Bill bottled up and (4) refuse to ratify the International Atomic Energy Treaty in Congress.

The "anti" forces against the Gore Bill report that an economy-minded Congress is not likely to appropriate nearly a half a billion dollars for a program that can't be shown essential to the national interest. They also feel that opposition to a federal nuclear power program will develop from coal mining states. The political jockeying would be much more interesting to watch if it were not of such serious import to the electrical industry.

—EW—

**The Burns Creek hydro and irrigation project on the Snake River near Idaho Falls is feasible for construction by the Bureau of Reclamation. Interior Secretary Seaton told Congress that the 90,000-kw, $40,000,000 installation also would smooth out peaking releases from the Palisades Dam.**

—EW—

**HORN OF PLENTY** — Even if automation is continued at its present rate it will take every available worker of the estimated work force of 80,000,000 in 1975 to keep on raising our standards of living at the rate at which it is being increased today. Furthermore, reported Don Mitchell, Sylvania's president, this work force would have to put in 40 hours a week.

Thus, the prospect of a shorter work week with an increased standard of living apparently moves out beyond the visible horizon, even with an accelerating rate of automation.

—EW—

**Elsewhere in this issue you will find interesting photos of Western industrial expansion. Westinghouse Electric's Sunnyvale operation is not represented there, but the electrical industry can be proud of it. Most recent information about Sunnyvale's activities is that propulsion equipment for five U.S. Navy atomic submarines is being constructed there.**

—EW—

**SPONSOR**—Chugach Electric Assn. of Alaska is sponsor of a project to determine the feasibility of a new type atomic power reactor, cooled by liquid sodium and moderated with heavy water.

The Atomic Energy Commission has let a contract for the project to Nuclear Development Corp. of America, White Plains, N.Y. When developed, the reactor will power a 10,000-kw plant for Chugach at Anchorage.

Only initial development and preliminary design are covered by the present contract.

—EW—

**SWITCH**—A change in administration has resulted in a new approach by Washington state officials to proposed construction of a steam generating station.

More details are back in "This Month's News," but it is possible the project may be turned over to an organization of utilities.

**PRIVATE?** — From the Kalispell, Mont., *Inter Lake* comes this concise explanation of "public vs private" power.

"...There are some 400 independent light and power companies in the U.S., and they supply about 80% of all the electric customers. These companies are owned directly by around 3,700,000 stockholders, and indirectly by the nation's 103,000,000 life insurance policy holders and its 21,000,000 depositors in mutual savings banks. . . . It would be pretty hard to conceive of anything more 'publicly owned' than our 'private' electrical companies. Stockholders can exercise some degree of control over a board of directors and officers of a company. That is more than we can say, in most instances, for the influence taxpayers wield over government bureaucrats."

—EW—

**ESCALATOR CLAUSE** — The Southern California Edison Co. proposed to the California Public Utilities Commission that electric rates follow a cost-of-production index similar to the manner in which cost-of-living variations are injected into labor contracts. With rates geared to be more volatile elements of costs, such as wages, fuel, taxes and other production expenses, the need for frequent applications for rate changes would be eliminated and there would be an equitable sharing in the ups and downs between customers and the company.

—EW—

**HIGHWAY ASPECTS** — Wyoming's governor has vetoed a bill which would have made it mandatory that the highway department pay for relocation of utility lines and poles necessitated by highway improvement. Reason: depletion of highway funds and the fact that the utilities benefit from using public rights-of-way for which no charge is made.

The bill was the first to have re-

**How to make money**

# foot after foot

**Self-dispensing Carton** with Inventory Keeper to minimize waste

**Color-coded Labels** to instantly identify insulation—red and white for neoprene, black and white for rubber

**Foot-after-foot Imprint** shows at a glance the gauge, number of conductors and type of insulation

**Why settle for less?**
When you call for cable, call for Carol.

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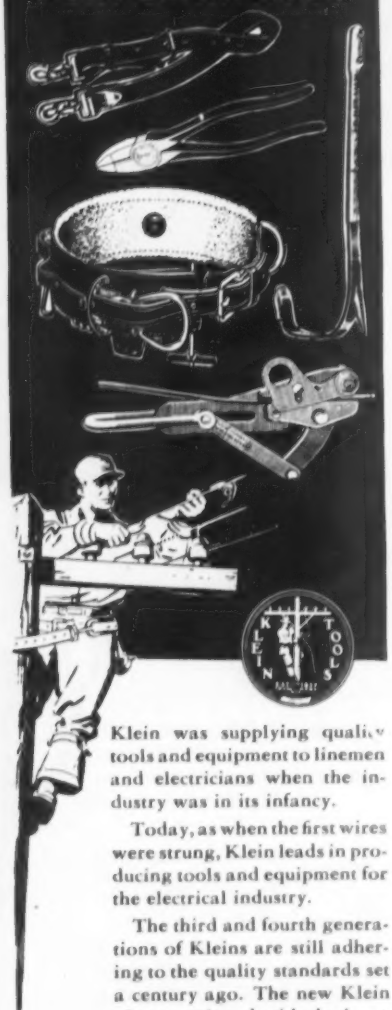
KLEIN

FOR GREATER SAFETY, BETTER PERFORMANCE



Klein was supplying quality tools and equipment to linemen and electricians when the industry was in its infancy.

Today, as when the first wires were strung, Klein leads in producing tools and equipment for the electrical industry.

The third and fourth generations of Kleins are still adhering to the quality standards set a century ago. The new Klein plant, equipped with the latest in manufacturing facilities, assures better, safer equipment, wherever power lines or communication lines are strung.

100 years of service to linemen, electricians and industry is back of this new Pocket Tool Guide No. 100. A copy will be sent you on request without obligation.

Mathias Klein & Sons
Established 1857 — Chicago, Ill., U.S.A.
7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS


received legislative approval so far this year. In 26 other states, similar bills to reimburse utilities for relocation costs (or broaden existing legislation) have already been introduced this year. In most of these, reimbursement would be for relocation on all federal aid systems.

—EW—

**FORTY-TO-ONE** — Dr. Ralph J. Watkins, director of research of Dun & Bradstreet, comes up with an analysis that shows that the American economy needs one business concern for approximately every 40 people. This ratio has held more or less stable for the past 25 years.

Projecting the figure to the current population estimates, by 1975 there would be required more than 5,750,000 new business concerns. Who said the age of the entrepreneur was dead?

—EW—

**So you thought gas lighting was dead? In Arizona, where they're experimenting with sun power for electricity, gas is trying to make a comeback. In imitation of the coal oil torches used to give jungle atmosphere in Hawaii, swimming pools are being bordered with gas torches and one hopeful manufacturer has brought in some gas lanterns for mounting on posts as garden lighting. If electricity can't repel that nostalgic invasion, the land had better be given back to the Indians!**

—EW—

*Fluorescent lighting installations using 840-cycle frequency, utilizing a motor-generator set to obtain the 840 cycles, results in increased lamp efficiency, lower initial cost and a 20% reduction in power consumption. In addition, air conditioning load can be reduced as much as 10%.*

—EW—

**NATURAL COMPENSATION** — Nature is doing her best to overcome the current slump in home building. This year is expected to hit the bottom on postwar marriages but from here on in until 1965 there will be a steady rise in new family formations which will bring the annual marriage rate back to about 2,000,000 — up one-third from its present low. Thus, the pressure for housing will gradually increase to the boom proportions that were enjoyed in the first half of the 50s.

**A GOOD POINT** — A Westinghouse manager recently stressed the value of the commercial viewpoint in the creation of a "most salable product." Referring to today's highly competitive economy, he said that "it is not sufficient to have a well engineered product—or even the best engineered product. The ideal is a happy combination of the ingredients making up the formula for the most salable product."

In defining the essentials for a "most salable product" attention was directed toward superior styling, good performance, extra competitive features and a competitive price.

—EW—

**SAFE AND SOUND** — The Value Line Investment Survey, probes into security values, recommends that investors have faith in public utility issues.

The survey points out that regulation permits a fair rate of return on companies' investments and, while the guarantee is not automatic, earnings and dividends of electric utilities have been remarkably stable and very desirable in periods of threatened business recession.

Conclusion: "Utility equities offer reasonable, secure income and freedom from anxiety—some of them even display growth characteristics."

—EW—

**EFFICIENCY** — Less than a year from now, in Warwick, Ga., a combination gas turbine-steam turbine generating station will go on the line for the Crisp County Power Commission. According to Dan Sinclair, manager and chief engineer of the commission, this will be the first time such a system has ever been designed from the start as a combined operation. Several power stations existing, however, do use the system for fuel efficiency.

The steam boiler will use pulverized coal, natural gas or oil. Exhaust from the gas turbine will flow to a Babcox & Wilcox boiler at 840 F and will assist the boiler in reaching high temperatures. The gas turbine exhaust will also serve to dry and transport coal and to heat feedwater.

—EW—

**BIG SNEEZE** — When the Oregon legislature held public hearings on a bill that would require utilities and public agencies to control ragweed, Frank G. Mackaness had a reply ready.

Mackaness, who is agricultural consultant for Portland General Electric Co., said:

"I have found no instance in the records where a plant of any species has been legislated out of existence."

He warned that a spraying program would injure many types of crops and "the farmers' claims alone would run to more than the total budget" for ragweed control.

—EW—

**UPTURN** — Figures compiled by the U. S. Office of Education indicate more students are preparing for engineering careers this year than any time since 1948. Last fall nearly 243,000 students were enrolled in accredited engineering colleges, a total which is almost equal to the all-time high of 1947, when the institutions were jammed with World War II veterans.

Senior students enrolled this last fall were numerically 20% greater than the previous year when approximately 24,000 engineering students were graduated. The figures also reveal that this year there are 22,240 students studying for master's degree and about 3,400 working toward their doctor's diploma.

—EW—

**The sixth Utility Management Workshop sponsored by the Department of Industrial & Management Engineering of Columbia University will be held at Arden House, Harriman, N.Y., July 28-Aug. 9. Mrs. Rae Wygant, 409 Engineering, Columbia University, New York 27, N.Y., has details.**

—EW—

**MERGERS**—H. K. Porter Co. has announced the acquisition of Federal Wire & Cable Co. Ltd., Guelph, Ontario. Federal is Canada's fourth largest wire and cable manufacturer.

From Carrier Corp. comes news of another impending merger. Carrier and Elliott Co. have agreed upon the basis whereby Elliott will be merged into Carrier. Elliott manufactures steam turbines, electrical equipment, heat transfer apparatus and industrial process equipment.

When the merger is effected, Elliott will continue under its present management as a division of Carrier.

—EW—

**WINNER**—The lighting education award in Division A of an international competition sponsored by the Better Light-Better Sight Bureau of Edison Electric Institute has gone to San Diego Gas & Electric Co.

The company's program of light-


NEW Revere ELECTRIC MFG. CO. CHICAGO, U.S.A.

Urban-Lite

END MOUNTING LUMINAIRE

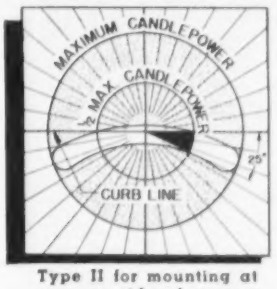
*for*

250 WATT H-5
175 WATT H-22
100 WATT H-4
HORIZONTAL BURNING
MERCURY LAMPS OR
MULTIPLE INCANDESCENT
LAMPS UP TO 4000 LUMENS

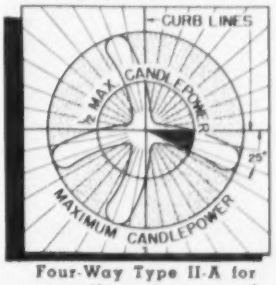
**Small • Neat • Modern • Low in Cost**

**for LIGHTING RESIDENTIAL AREAS OR STREETS WHERE LOW LEVEL LIGHTING IS DESIRED**

AVAILABLE FOR TYPE II and II-A DISTRIBUTION




Type II for mounting at or near side of narrow roadway.




Four-Way Type II-A for mounting at corner of intersection.

Here's *the* Luminaire for lighting residential areas or for any street where uniform low-level lighting is desired. It provides an economical means of utilizing the smaller, highly efficient Mercury Lamps where higher intensities are not required, or it can also be used with multiple incandescent Lamps up to 4000 lumens.

Its sturdy, one-piece reflector housing with proper glassware is designed to produce A. S. A. - I. E. S. Type II or Type II-A distribution. It is made of heavy gauge aluminum. Reflecting surface is Alzak processed to produce high efficiency and utilization of light. Housing is supported by a gasketed cast aluminum neck having an end-mounting slip fitter for 1¼ in. or 2 in. pipe and is adjustable 4° above or below horizontal.

Revere-Corning Prismatic Glassware is heavy, clear pressed crystal and offers high light transmission together with high efficiency and ease of cleaning. Strong, extruded aluminum lens ring holds glassware firmly against a thick, soft, weather-proof felt gasket by means of a spring loaded stainless steel hinge and latch. Moisture, bugs and dirt are sealed out.

A fitting companion to Revere "Star-Lux" and "Endoval" Luminaires. Write today for Bulletin 700-51.

**REVERE ELECTRIC MFG. CO. • 6009-17 BROADWAY • CHICAGO 40, ILL.**

*Available in Canada thru Curtis Lighting, Ltd., Leaside, Toronto, Ontario*

THE ONLY COMPLETE LINE OF LUMINAIRES - FLOODLIGHTS AND POLES FOR STREET - SPORTS AIRPORT - SERVICE STATION - OUTDOOR THEATRE - MARINE AND INDUSTRIAL LIGHTING

One call...
AEROVOX...
Capacitors for all electrically efficient high starting torque capacity motors and for motor running applications too!
BUNTING...
Brass & Bronze... Precision all... Electric Motor Bearings, Standard Stock Bearings, Bronze Bars and Graphited Oiless Bearings.
For ALL top brands
TOLEDO...
Commutators and Collector Rings for Motors and Generators of Highest Quality, to fit the needs of Production and Repair.
In PRODUCTION and MAINTENANCE too!
OHIO...
Carbon Brushes Pre-tested for Electric Motors and Generators to fit thousands of applications in tools, equipment and appliances for home and industry.
FACTORY REPRESENTATIVE
TRI-STATE
SUPPLY CORPORATIONS
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SEATTLE 4 • 318 Occidental Avenue Main 4161

ing education was judged best for fostering better understanding of the relationship between light and sight. It reached architects, optometrists, electrical contractors, school administrators, industrial executives, businessmen and individuals.

—EW—

**SICK CALL** – Prolonged illness strikes employees at the rate of 39 per thousand employed and costs the nation $2 billion annually in lost production time as well as $800,000,000 in lost wages. This is the essence of the findings of a five-year study recently completed by the Research Council for Economic Security (Chicago, Ill.) and published in a $10 volume entitled *Prolonged Illness-Absenteeism.*

Average duration of prolonged illnesses was a startling 10.9 weeks. Stated another way, absentee workers represent 8.6 full-time employees per thousand on the pay roll. Production lost is the work of 453,000 men for a full year.

—EW—

**As Montana's governor signed a joint memorial urging Congress to settle the site controversy of Yellowtail Dam, Robert Yellowtail told a House Interior committee:**

**"This whole project is the dream child of a bunch of vote-getting politicians. It's a foolish waste of the taxpayers' money. If you insist on going through with it, you can take my name off it."**

—EW—

**AWARDS**—Two employees of the Puget Sound Power & Light Co. have received National Merit Awards from the National Office Management Assn. They are William Dudley, supervisor of life insurance and pensions, and Harold Abramson, staff accountant in the billing department.

The awards were made for leadership and service in the Seattle area in the management field and for meritorious service to the Seattle chapter of the association.

—EW—

**TEAM** – Sylvania Electric Products Inc. and Corning Glass Works have formed Sylvania-Corning Nuclear Corp. for the purpose of expanded research, development and production activities in the atomic energy field.

**SHUTDOWN**—It is possible as you read this that construction work on Ice Harbor Dam may be at a standstill because of lack of funds.

Col. Myron E. Page, Walla Walla district engineer, reported that funds were available to keep work going until May 24.

If additional money has not been allocated, the contractor has the option of closing down operations until the end of the fiscal year June 30.

First concrete pouring was scheduled for June 1.

—EW—

**DRAGNET**—Joe Pettet, a telephone lineman, was checking out a Bozeman - West Yellowstone circuit recently when he overheard a West Yellowstone grocer tell the Gallatin sheriff's office that his delivery truck had been stolen.

As the conversation ended, Pettet saw the truck go by on the highway, called Sheriff Don Skerritt, and within 15 minutes a 16-year-old escapee from the St. Anthony, Idaho, State School was back in custody.

That is real service.

—EW—

**A. B. Chance Co. has purchased American Crossarm & Conduit Co. via an exchange of stock, and will operate the new acquisition as a wholly owned subsidiary.**

—EW—

*There is waiting for you, if you work with bus conductors, a copy of "Alcoa Aluminum Bus Conductor Handbook." It is a fully illustrated, 270-page hardback book that will be seeing a lot of service in the industry. Write on your company letterhead to Aluminum Co. of America, 793 Alcoa Bldg., Pittsburgh 19, Pa.*

—EW—

**INSULATION STUDY** – A five-year General Electric study on reduced transformer insulation led to the conclusion that two-stepdown insulation should be applicable to many high-voltage power systems.

The study concluded that switching surge voltage rather than lightning surge voltage is the main consideration in coordinating two-stepdown BIL transformers and that further work is necessary to establish industry standards for evaluating protection.

Homeowners enjoy this modern, convenient protection for circuits. No fuses to change, no danger of shock. Just push a button to restore service.

1955 House & Garden, "House of Ideas", Birmingham, Michigan

Electronic Homes, Chicago, Illinois, built by Ben Sears

Kendall Park, Franklin Park, New Jersey, built by Kendall Builders, Inc.

Barrett Brae, St. Louis, Missouri, built by Fischer & Frichtel

Paddock Hills, St. Louis, Missouri, built by Mayer, Raisher & Mayer

Robinwood, St. Louis, Missouri, built by Contemporary Homes

◀ Northland Home, Detroit, Michigan, built by Edward Rose & Sons

# Leading builders feature Pushmatic-Protected Homes

**Standardize on BullDog panels to provide one main disconnect and *over-all* electrical safety.**

Like these big builders, you'll find a Pushmatic Electri-Center® is a feature which more and more home buyers demand. It offers *maximum over-all electrical protection,* push-button convenience and full capacity for both present and future circuit needs. Main disconnects—one for each 100 amps of service—protect service entrance conductors. Duo-Guard Pushmatics® safeguard against branch circuit overloads and shorts caused by faulty cords. And Pushmatics cost no more than ordinary breakers, either.

What's more, powerful BullDog national advertising continues to pre-sell builders and the buying public . . . creates acceptance which makes *your* selling job easier. Order through your electrical distributor.

© BEPCO

**BullDog Electric Products Company, Detroit 32, Michigan • A Division of I-T-E Circuit Breaker Company. • *Export Division:* 13 East 40th St., New York 16, N.Y. *In Canada:* BullDog Electric Products Co. (Canada), Ltd., 80 Clayson Rd., Toronto 15, Ontario.**

IF IT'S NEW . . . IF IT'S DIFFERENT . . . IF IT'S BETTER . . . IT'S

**BULLDOG**

**ELECTRIC PRODUCTS COMPANY**

A DIVISION OF I-T-E CIRCUIT BREAKER COMPANY

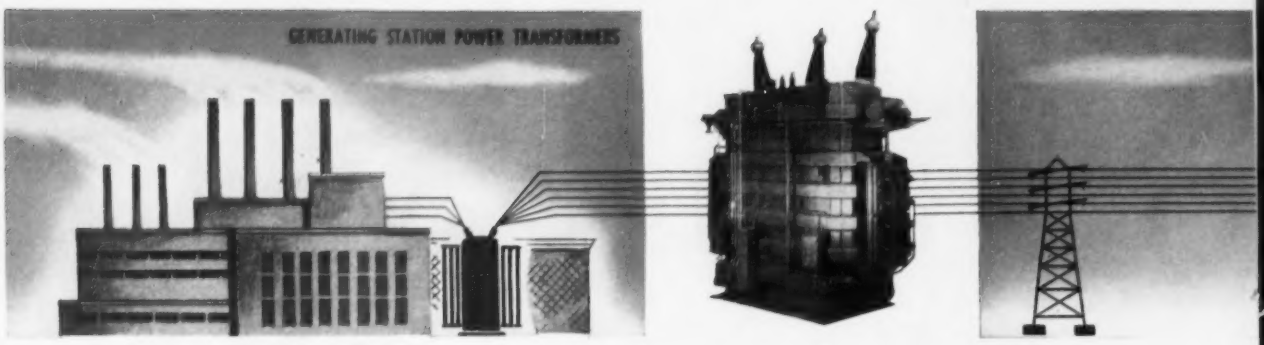
**CONSULT THE FOLLOWING PACIFIC COAST REPRESENTATIVES:**

**COAST ELECTRIC & MANUFACTURING CO.**
1733 N.E. Seventh Avenue, P.O. Box 7712
Portland 12, Oregon

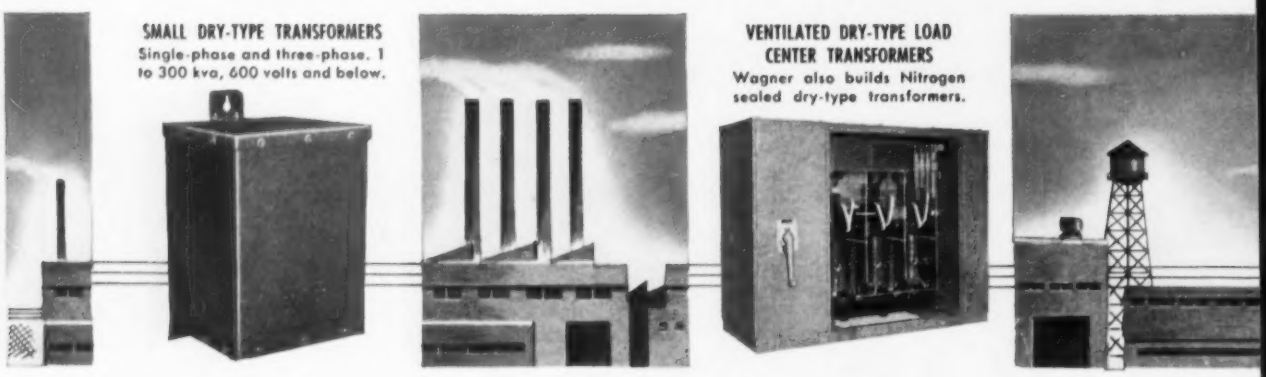
**YOUNG ELECTRIC & MFG. CO.**
2134 Curtis St.
Denver 2, Colorado

**SAFETY SWITCHBOARD COMPANY**
910—89th Avenue
Oakland 21, California

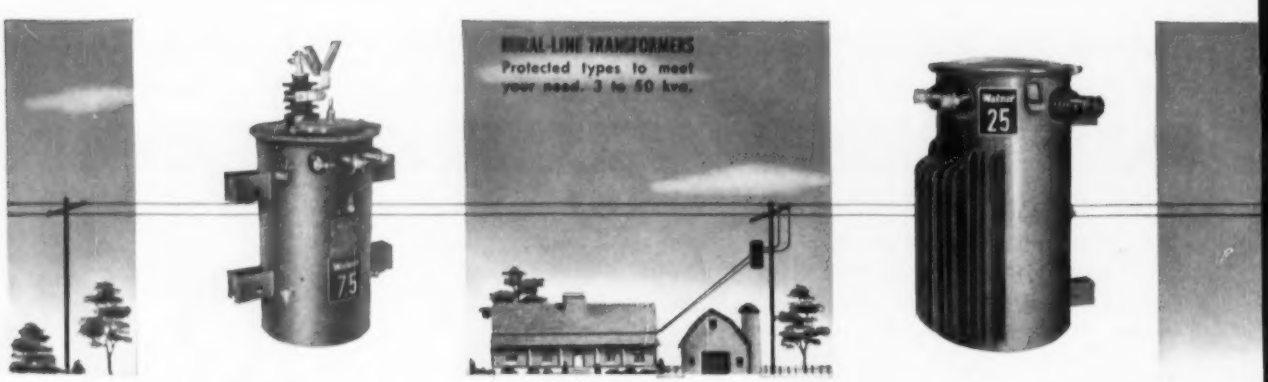
**BULLDOG ELEC. PROD. CO. OF LOS ANGELES**
2885 E. Washington Blvd.
Los Angeles 23, California




# WAGNER TRANSFORMERS


SMALL DRY-TYPE TRANSFORMERS
Single-phase and three-phase. 1 to 300 kva, 600 volts and below.
VENTILATED DRY-TYPE LOAD CENTER TRANSFORMERS
Wagner also builds Nitrogen sealed dry-type transformers.

## Central Station - - Industrial - -



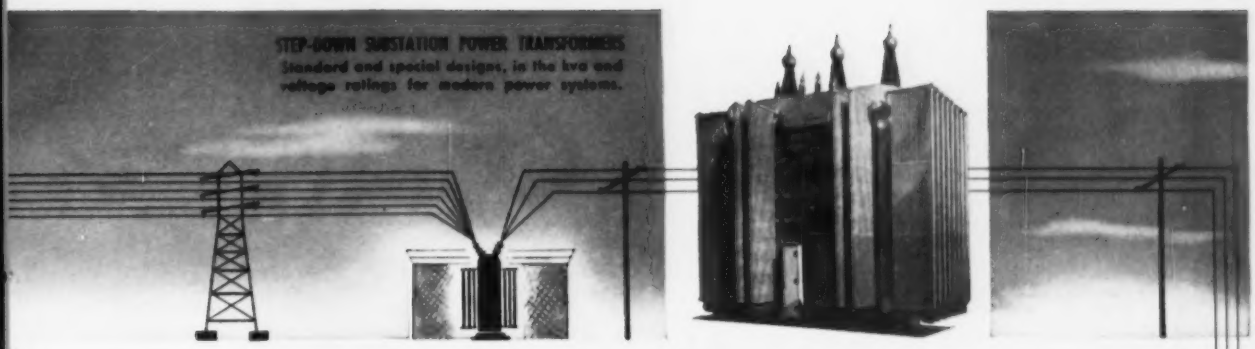

## ENGINEERED FOR LONG

T57-16

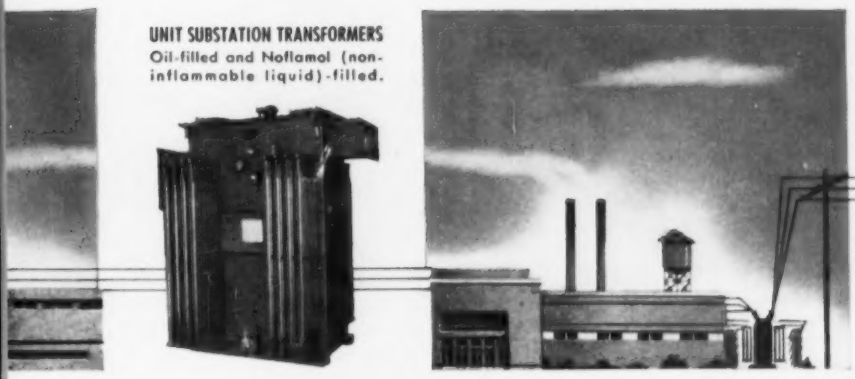
Wagner Electric Corporation
SERVING INDUSTRY SINCE 1891

BRANCHES AND DISTRIBUTORS
IN ALL PRINCIPAL CITIES

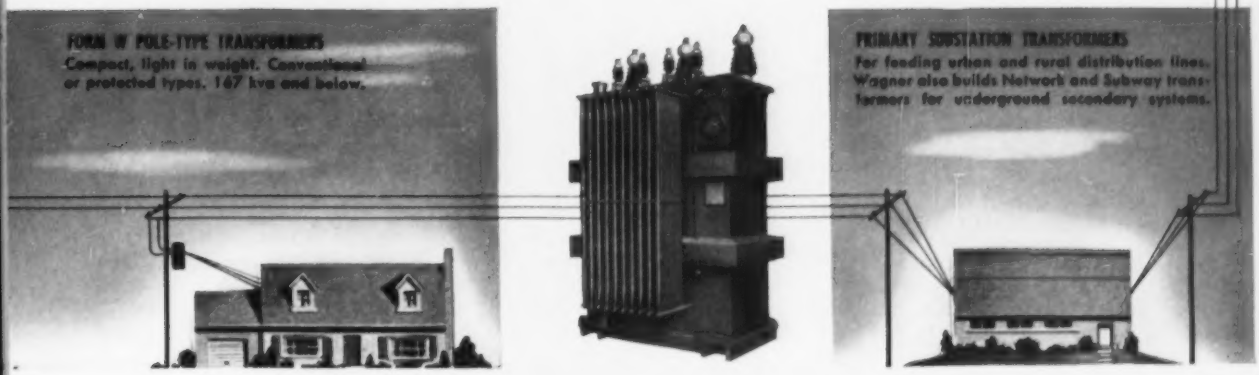
ELECTRIC MOTORS • TRANSFORMERS •


STEP-DOWN SUBSTATION POWER TRANSFORMERS
Standard and special designs, in the kva and voltage ratings for modern power systems.

# FOR EVERY NEED . . .


UNIT SUBSTATION TRANSFORMERS
Oil-filled and Noflamol (non-inflammable liquid)-filled.
INDUSTRIAL SUBSTATION POWER TRANSFORMERS
Medium sized transformers built to ASA Standards C57.12b.

# Transmission - - Distribution

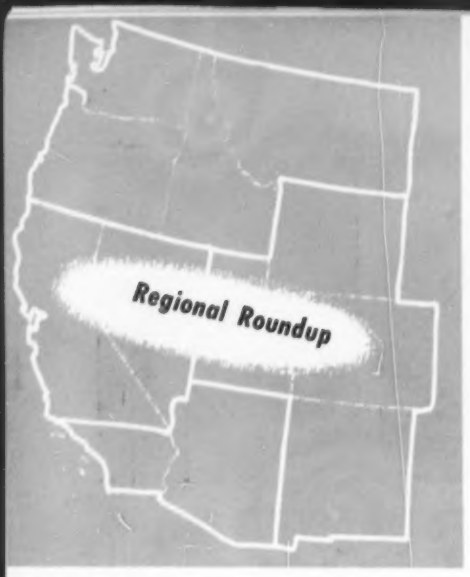

FORM W POLE-TYPE TRANSFORMERS
Compact, light in weight. Conventional or protected types. 167 kva and below.
PRIMARY SUBSTATION TRANSFORMERS
For feeding urban and rural distribution lines. Wagner also builds Network and Subway transformers for underground secondary systems.

# DEPENDABLE SERVICE

Wagner Electric Corporation
6381 PLYMOUTH AVENUE, ST. LOUIS 14, MO., U.S.A.

LIVE BETTER ELECTRICALLY

INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS—AIR & HYDRAULIC




# Pacific Northwest Region

"ATOMS for Peace" came to Portland in mid-April in the form of an exhibit built by the Atomic Energy Commission at Oak Ridge, Tenn. Sponsored by the local power companies and Reed College, the seven-day stay in the civic auditorium played to over 10,000 visitors. A feature was a 16-ft working model of an atomic energy plant for producing electricity. Ray Flowers of AEC arranged the exhibit. Working with him were Rollie Gabel, Portland General Electric Co. promotion coordinator, and R. K. "Jack" Foley, advertising and public relations manager for Pacific Power & Light.

► Several special engineering studies have been assigned to John Bankus, chief engineer, PGE, by Gen. O. E. Walsh, vice-president. Among them will be a long-range study of additional steam plants for the company system, to include available fuels, cost trends, proper locations, and size and characteristics of the plant at each location.

► Louis Nielson, superintendent of distribution for PGE since 1953, retired in May. He started with the company as a lineman in 1925.

► Other organizations are meeting, too, notably the Public Utilities Advertising Assn., in Cleveland, May 9 and 10. They have awarded PGE second place in the 1957 Better Copy Contest, in the classification covering a complete advertising program. Fred Kempe, director of public relations and advertising, entered his spring campaign on "Life Saver Range Contest and Operation Trade-In," developed in collaboration with Duke Wieden, account executive of the Joseph R. Gerber Co., PGE's agency, and came out with the red ribbon. Kempe went to Cleveland and received the award in person.

► Some top-level changes and promotions among the big manufacturers of wire and cable in the Northwest sum up like this. C. S. Thayer, Alcoa's operations manager in the area since the company first opened its Vancouver, Wash., plant, has retired, and is succeeded by his former assistant, Donald H. Tilson. John T. Barclay has taken over the managership of the fabricating operation at Vancouver, replacing his former boss, E. D. Mairs, who has gone to Lafayette, Ind., to manage Alcoa's plant there.

► The Northwest will lose another aluminum man by the promotion route when Vernon G. Kneeskern, manager of Reynolds Metals Co. reduction plant at Longview, Wash., takes over the company's new plant in Massena, N.J. That plant is under construction so the actual move is some months away. In the meantime Kneeskern is working on the design of the new plant and "doubling in brass" at Longview.

► There is other activity in the wire and cable field. John H. Sargent, sales engineer for Columbia-Geneva Steel Co. on the coast, announces a new salesman for the Washington territory, Donald H. Pierce, with headquarters in Seattle. The company will soon be warehousing in Portland, where Frank Stewart is manager, he says.

► Phelps Dodge Copper Products is also planning a new warehouse in Portland. Roger Baylee is Portland manager.

► Mark up a new job for an old-timer in the territory. Henry G. "Hank" Lehl is now sales and marketing manager for Schwager-Wood Corp., coordinating the national distribution of S-W switches through manufacturer's representatives. Hank, for many years sales manager for General Electric Supply Co. in Portland, has for the past few years carried on his own business as Lehl Supply Co. in Pasco, Wash.

► Graybar's long-time and favorably known Spokane manager, Vernon E. "Mickey" McCain, is retiring as of the end of May. He is succeeded by Howard Colburn from the Eugene, Ore., branch.

► Douglas Hood Co. of Portland, maker of trailers, has a new design of hydraulic operated derrick, winch and digger combined in one unit. The salesman in this department, Norman W. Page, is taking a demonstrator unit around the territory.

► Maydwell & Hartzell Inc. has put on a new man to work out of the Portland office covering southern Oregon.

► A "like father like son" illustration is found in the recent election of Frank M. Warren Jr., president of Portland General Electric Co., to be president of the Port of Portland Commission. His father, the late Frank M. Warren, a prominent citizen of the previous generation, held this important civic post 25 years ago.

► *Add Miscellaneous Kudos* — Jack Cottingham, illumination consultant for PGE, won first place in the IES competition for residential lighting design for his work on the company's model Electri-Living home, which won first place in the national contest sponsored by *Living For Young Homemakers* magazine. Ralph Conver, the company's residential sales representative, carried off the Junior Chamber of Commerce award for work in youth welfare for 1956, known as the Ed Dillavou Award. Last year the award went to another PGEer, Jim Staines of the general accounting department.

# Pacific Southwest Region

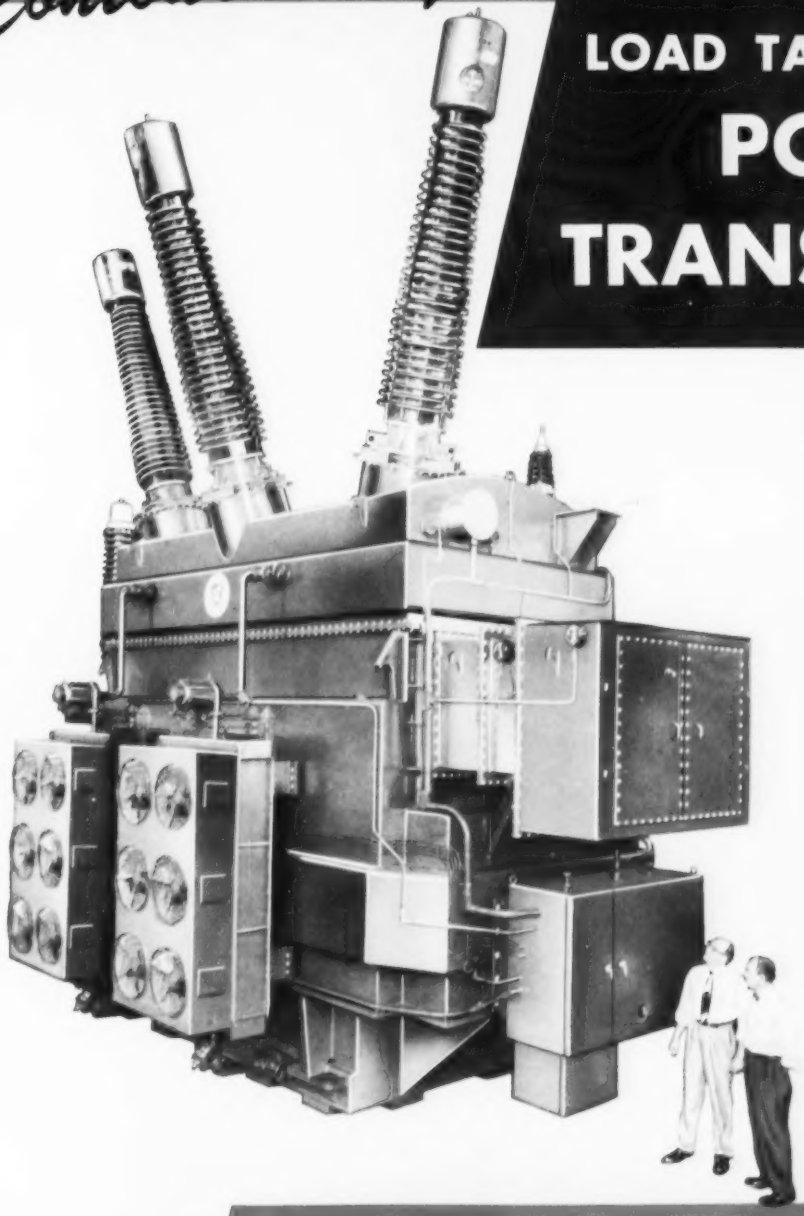
ANACONDA Wire & Cable recently announced plans to begin construction of a new mill and office facility in Orange, Calif., later this year. No definite date has been set for starting construction of the plant but cost is estimated at between $3,000,000 and $4,000,000. Included will be increased warehousing space, which will enable Anaconda to supply more finished goods for sale through its area dealers than are available at the present. A. W. Tracy of Anaconda said that the new facilities will increase potential employment some 10% above its present 800 or 900, and will make it possible for the company to handle production of additional items.

# 100,000 Kva, 330 Kv

THREE PHASE.....

*Contour Design*

## PENNSYLVANIA LOAD TAP CHANGING POWER TRANSFORMER



**The efficiency and compactness of Pennsylvania's shell-form Contour Design were "made to order" for this 100,000 kva, 330 kv transformer — one of the largest ever built from the standpoint of voltage. The unit will step down a transmission-line voltage of 330,000 volts to the 14,400 volts required for plant distribution. Its features include corona-free high-voltage coils with uniform impulse voltage distribution . . . and Pennsylvania's new high-capacity load tap changing equipment, designed for applications through 150,000 kva. The forced-oil cooling system has four oil-to-air heat exchangers.**

pt

**PENNSYLVANIA TRANSFORMER COMPAN**

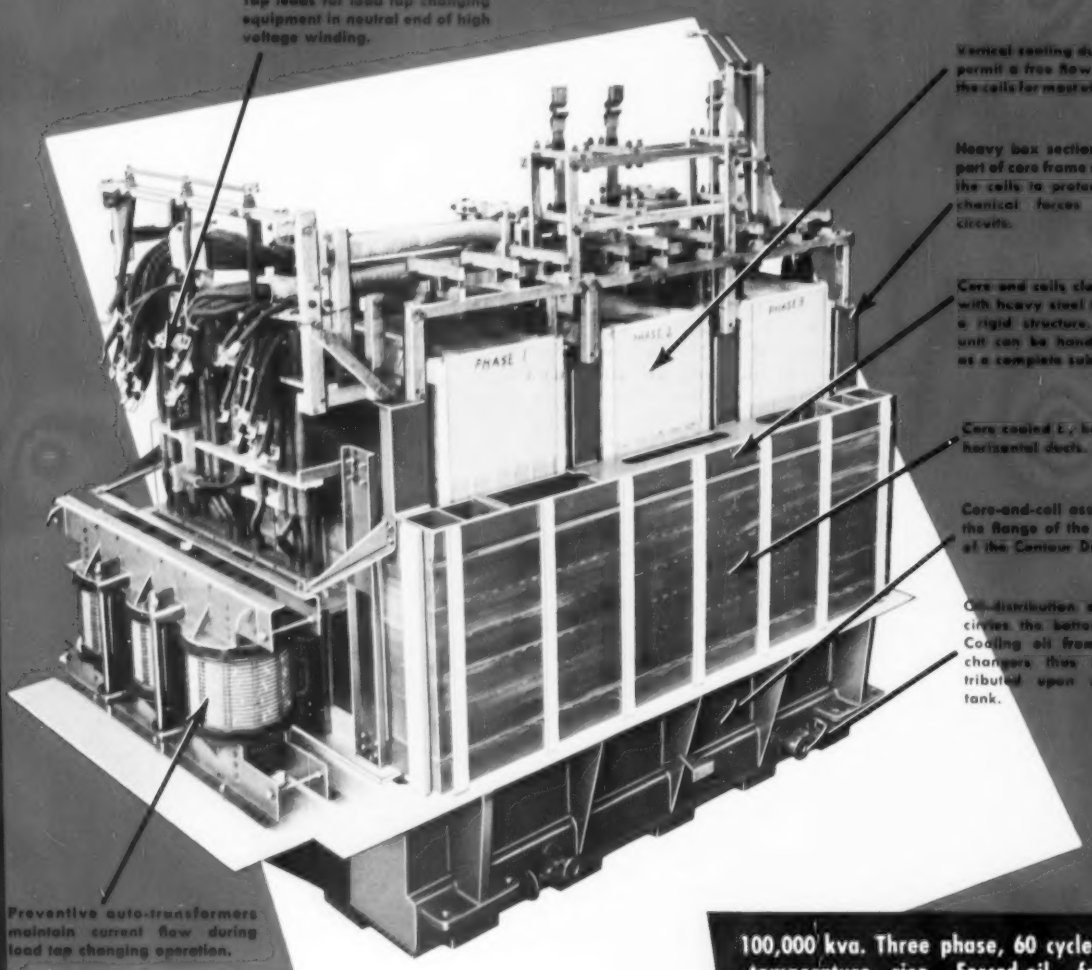
*A McGraw Electric Company Division*

CANONSBURG, PENNSYLVANIA • *Greater Pittsburgh District*

see next page for inside story

# inside a 100,000 Kva, 330 Kv

## THREE PHASE *Contour Design* PENNSYLVANIA LOAD TAP CHANGING POWER TRANSFORMER




Tap leads for load tap changing equipment in neutral end of high voltage winding.

Vertical cooling ducts in the coils permit a free flow of oil through the coils for most efficient cooling.

Heavy box sections which form part of core frame securely clamp the coils to protect against mechanical forces during short circuits.

Core and coils clamped together with heavy steel frames to form a rigid structure. Core-and-coil unit can be handled seperately as a complete sub-assembly.

Core cooled by both vertical and horizontal ducts.

Core-and-coil assembly rests on the flange of the bottom section of the Contour Design tank.

Oil-distribution duct completely circles the bottom of the tank. Cooling oil from the heat exchangers thus is evenly distributed upon re-entering the tank.

Preventive auto-transformers maintain current flow during load tap changing operation.

100,000 kva. Three phase, 60 cycles, 55° C. temperature rise. Forced-oil, forced-air cooled. High voltage: 330,000 Grd. Y volts. Low voltage: 14,400Δ volts. Load tap changing equipment for ± 10% regulation in 32 steps of 5/8%.

**PENNSYLVANIA TRANSFORMER COMPANY**

*A McGraw Electric Company Division*

**CANONSBURG, PENNSYLVANIA** • ***Greater Pittsburgh District***

For external view, see other side.

Also from Anaconda comes word of three promotions. Former President H. Donn Kerresey is newly elected chairman of the board. His presidential spot is now being taken over by W. E. Sprackling, former executive vice-president, and Richard Steinmetz, formerly vice-president in charge of manufacturing, steps in as executive vice-president.

► Jack Payne of the Jack Payne Co., Los Angeles, flew to Washington, D. C., the week of May 26 to attend the NAED convention.

Other activity in the Jack Payne organization includes the recent appointment of three new sales representatives. Jerry Redburn has been resident sales representative in Phoenix since April 1. His territory includes Arizona, New Mexico and El Paso, Tex.

Two new southern California sales representatives for Jack Payne are Sam Kobert, formerly associated with Eagle Electric Mfg. Co. of New York, and George Sloan, formerly of Sloan & Parrish. Sloan also will do industrial promotion work.

► Hoffman Electronic Corp., Los Angeles, recently established two new departments to develop semiconductors and solar energy converters. H. Leslie Hoffman, president, stated in making the announcement that the Hoffman Laboratories Inc., a subsidiary of Hoffman Electronics of Los Angeles, will take over research and development of semiconductors for industrial and government application. The Solar Division, established in Evanston, Ill., will operate as a part of Hoffman Semiconductor Division in development and production of the solar energy converters. N. J. Regnier will serve as manager of the semiconductor equipment design section in Los Angeles, under the direction of Hoffman Laboratories President James D. McLean.

► Conferences, conventions and various shows took the limelight for several Los Angeles area firms during May. The PCEA conference in San Francisco brought John H. Schuler, vice-president of Anderson Electric in Birmingham, Ala., to the coast. He visited Industrial Engineering & Equipment Corp., one of its southern California representatives.

This same meeting was attended by several members of Earl S. Condon Electrical Manufacturers, Los Angeles. The junket to San Francisco's Fairmont Hotel included: Condon; Ashton Davis, general manager; Charles Morris and Edward Maupin, accompanied by their wives. Malcolm McDonald was the sole bachelor in the Condon convoy.

► T. R. Glick of Rutkin Electrical Sales Co., Los Angeles, was in Washington from May 26 to 29 attending the electrical distributors convention as a representative of Briegel Method Tools.

► Daystrom Pacific Corp. of Santa Monica will open a new 60,000-sq-ft plant in Westchester on July 1. The new plant will provide room for future expansion and increased production.

► Graybar Electric Co. of Los Angeles also is in the midst of an expansion program. The company began construction in April on its eighth and, to date, largest branch office and warehouse in Van Nuys. The 47,000-sq-ft half-million dollar facility, scheduled for completion in October, will provide increased warehousing space for major appliances, electrical construction supplies, and one of the largest appliance dealer counters available to date. The Van Nuys branch will enable Graybar to maintain closer contact with its southern California dealers and provide greater ease in delivery of items to the area dealerships. It also is planned as a means of encouraging dealers to warehouse in a central location.

► Spence Purnell of Westinghouse Electric Corp. in Los Angeles recently announced the appointment of David C. Conrad as semiconductor sales representative for the Los Angeles area. He will headquarter in the Los Angeles branch office.

## Intermountain Region

LINE Material Industries is the latest outfit to expand into new quarters at Denver. The firm is getting ready to move about June 15 into a new one-story warehouse and office building in the city's new northeastern industrial area.

The concrete and brick building with 13,000 sq ft of space is at 39th & Forest, only a block from Public Service Co. of Colorado's new warehouse and shops.

W. G. Gestland, district manager, said the Denver facilities "have been the backup warehouse for the West and we'll be able to provide even better accommodations in the new building."

► Sangre de Cristo Electric Assn., an REA with headquarters at Salida, Colo., will build a new office and warehouse at Buena Vista, Colo.

Wesley L. Pounds, manager, said the new tile and stucco building, 60x30 feet, will include a display room for appliance dealers, office space and a warehouse.

Pounds said Sangre de Cristo plans to build a heavy three-phase line between Salida and Coaldale this summer to link the two power sources of the system. The southeast section is served now by power purchased from Southern Colorado Power Co. and the northern section uses power purchased from the Bureau of Reclamation brought into the area over Public Service Co. of Colorado lines.

► V. N. Garretson, who joined the company in February 1912, has retired as manager of the electric wire and cable department of Hendrie & Bolthoff Co., Denver, major distributing firm in the Rockies. Edward C. Potts, who has been assistant to Garretson, was appointed manager. Potts, with H&B since April 1953, was in electric wiring construction for 17 years before. Succeeding Potts is Norman Aughinbaugh.

► Mrs. Phyllis Kern, secretary to Donald T. Spangenberg, director of advertising for Public Service Co. of Colorado, placed second in the nation-wide "Miss Secretary of 1957 Contest." Mrs. Kern spent a week in Washington, D. C., in the finals of the competition sponsored by the national association and Council of Business Schools. "When I give Mrs. Kern something to do," said Spangenberg, "I know it's as good as done." Mrs. Kern said she believes "loyalty, reliability and initiative" are the chief qualities for success as a secretary.

► Denver's municipal government has received its first $1,000,000 check for taxes—from Public Service Co. of Colorado. The check, exactly $1,087,001, was delivered by W. C. Lazarus, property tax agent for Public Service.

► R. D. Payne, with General Electric since 1947, has been appointed electric utility application engineer for General Electric's apparatus sales division in Denver.

► Clifford K. Beabout of Mountain States Machinery Co. reports his firm has been appointed exclu-

sive agent in Colorado and Wyoming for Esterline-Angus Co. Inc. of Indianapolis, Ind., manufacturer of recording instruments. Mountain States also represents Delta Star Division of H. K. Porter Co.

► Joe Bacher, formerly with Dale Products Co. at Albuquerque, N. M., has been appointed field engineer for New Mexico and Arizona by Allen I. Williams Co. of Denver, representative of Fisher-Pierce Co.

► The Rocky Mountain Electrical Manufacturers' Representative Club has voted to stage an electrical exhibit in Denver next spring. This is the first time the club has attempted such a venture but President Glenn Gaer already has started committees at work. The exact dates and location will be determined later.

► The transfer of Bruce Sessin to St. Louis has precipitated changes at the General Cable Co. office in Denver. Sessin, who was sales representative for southern and western Colorado, has been replaced by Lee Peach, formerly in charge of inside sales at the Denver office. Peach's successor is Frank A. Keppelmann, formerly with Graybar Electric Co. at Denver.

► Slaybaugh - Thompson Co. of Denver has been named exclusive agent in Colorado, Utah, Wyoming and New Mexico for Malleable Iron Fittings Co.'s pole line hardware division. William Thompson, partner in the firm, said an aggressive program is planned to sell Malleable's distribution and transmission equipment in the region.

► A regional pipe division has been established for the Rocky Mountain region by the Johns Manville Sales Corp. Jack Davis, with the firm 14 years at Denver, has been appointed regional sales manager for the area that includes Montana, Utah, southern Idaho, Wyoming, Colorado, New Mexico, El Paso, Tex., western Nebraska and South Dakota. The division will handle all J-M's tubular products. Others in the office are Angus E. Slee, staff manager for direct sales, Richard Rice, sales clerk, and Janice Hartway, secretary. "This is another move in our attempt to give better service through specialization," Davis said.

► The growing demands of the area have also caused General Electric's Construction Materials Division to enlarge its Denver staff. W. G. Craighead, district representative since 1949, will devote his entire time to the Denver market while Larry Trenam, transferred to Denver from Bridgeport, Conn., will travel in Colorado, Wyoming, New Mexico and western South Dakota. Craighead formerly handled the entire area himself.

## Northern California Region

HOSPITALITY has taken on a new meaning to your reporter. The reason for this is the interpretation of the word by the Central Valley Empire Assn. and the citizens of the San Joaquin Valley. They recently gave nine industrial editors a red carpet tour that was hospitality at its finest.

Of particular interest to an electrical industry editor was the prominent part electrical industry folks are playing in the further development of a rich and beautiful area. For example, Wayne Stone was on hand with an automobile and a role as guide in and around Fresno. He is with Pacific Gas and Electric Co.

At Visalia, Frank Johns Jr. of Empire Electric Co. is president of the Chamber of Commerce, and plays an active part in civic affairs and promotion of industrial development. Wayne Shelley, factory manager of Line Material Industries impressive new facility at Visalia, is a comparative newcomer but is already caught up in the activities of the community.

And on the subject of Line Material's new plant — it's a beauty. Clean and airy throughout, the entire facility is decorated in a combination of light and dark green with color accents from machinery and girders. This is in a manufacturing plant, you understand. Wayne Shelley is justly proud of the installation.

The plant was in the process of turning out its first transformers on May 1. It will produce L-M's Round Wound transformers with ratings from 5 to 50 kva. There were still a few installers and contractor personnel on the scene, but production was under way. There are about 40 people at work now, but Wayne said employment should be up to 100 by the end of this year.

L-M brought a nucleus of nine people to Visalia from other plants in the organization and is making up the rest of the staff from the local labor pool. The company started in January to train the young men and women who are now operating the machines and equipment necessary to the production of transformers.

A note of interest: L-M found that Visalia was the center of a seven-state market for the transformers.

► Paul E. Paules is now Western regional manager of the Scientific Instruments Division of Beckman Instruments Inc. From San Francisco he will handle company services in the 11 Western states.

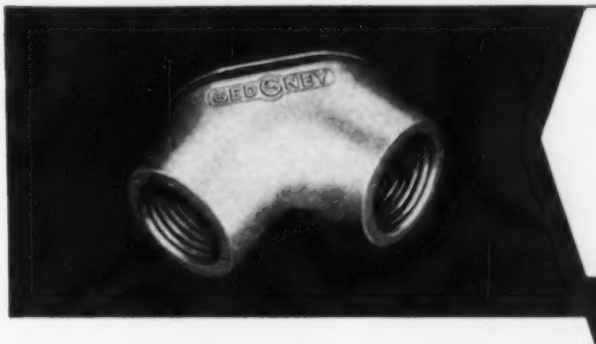
► Max Eisler, power and industrial equipment installation specialist, has joined Kaiser Engineers in Oakland as a principal engineer. His first assignment is installation of electrical equipment in Kaiser Aluminum's new rolling mill in West Virginia.

**The first transformer coils shown coming off Line Material's Visalia plant line**

# GEDNEY'S RIGHT THERE IN YOUR CORNER

## *helping save time . . . hold down costs*

CORNER FITTINGS? Well, here are three that have proved immensely popular for the simple reason they're easiest to install—save time and labor that really counts up. Like the rest of the full Gedney line they're made of unbreakable malleable iron...accurately machined and threaded . . . individually inspected. Order Gedney—always—for lowest installed costs!

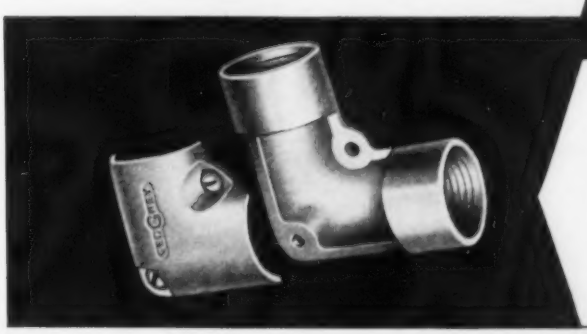



90° CORNER ELLS

**Fitted with gasketed cover. Both ends female. Made of malleable iron, cadmium plated. Available in a full range of sizes from ½" to 2".**

90° CORNER ADAPTERS

**Fitted with gasketed cover. One end male, one end female. Made of malleable iron, cadmium plated. Your choice of sizes from ½" to 2".**




CORNER PULL-IN CONDUIT ELLS

**Today's top specification for space-saving, machine wiring, easy wire pulling. Malleable iron, cadmium plated. Sizes run from ½" to 2".**

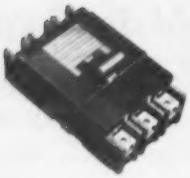
**GEDNEY FITTINGS FIT**

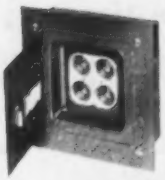
**GEDNEY**
**ELECTRIC COMPANY**

GEDNEY

RKO BLDG. • RADIO CITY • NEW YORK 20
Foundry, Factory and Shipping Point: Terryville, Conn.

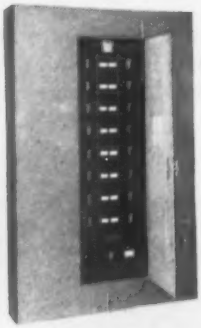
• Safety Switches and Industrial Circuit Breakers





• Fusible and Circuit Breaker Load Centers

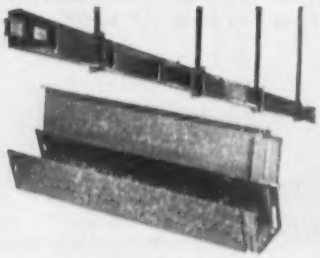
• Voltage Testers



• Fusible and Circuit Breaker Lighting and Power Panelboards

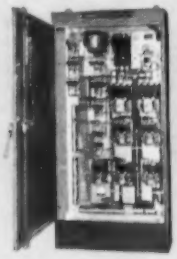
• Power Distribution Switchboards and Switchgear

# Wherever Electricity



• Busways and Wireways

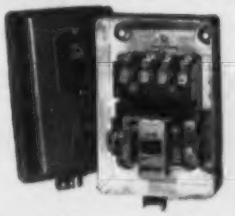
EC&M High Voltage and Synchronous Starters



• Special Purpose Control

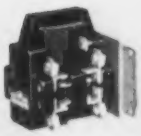
• Control Centers

SQUARE D COMPANY

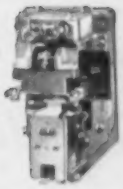


• A.C. Manual and Magnetic Starters

• Drum Switches



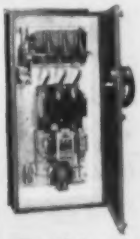
• Control Relays



• Timing Relays

• Limit Switches

• Pushbuttons



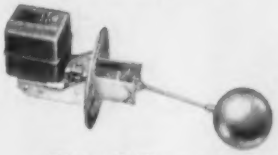
• Combination Starters

• Manual Compensators

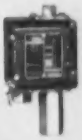
• All Types of Reduced Voltage Starters

• D.C. Starters

• Electronic and Electro-Magnetic Welder Control

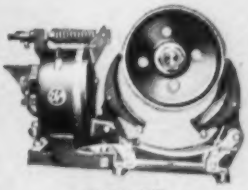


• Float & Pressure Controls for Pumps & Compressors



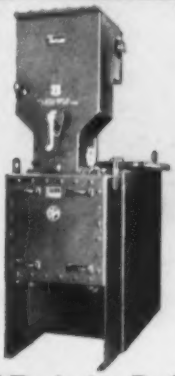
# is Distributed and Controlled

EC&M Lifting Magnets

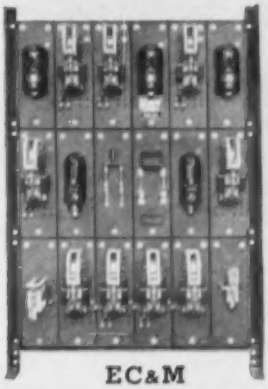


EC&M Magnetic Brakes

**FIELD ENGINEERING SERVICE**
available through Square D branch offices in all principal United States cities
... and in Canada, Mexico and England



EC&M Explosion-Resisting Control for Petroleum Industry



EC&M Crane and Mill Control

DESIGN LEADERSHIP FOR MORE THAN 50 YEARS

## Your Westinghouse representative can prove . . .

# NEW TD INDICATOR SIMPLIFIES TRANSFORMER LOAD MANAGEMENT

**The new thermal duty indicator records total overload hours cumulatively —simplifies overload monitoring. Because it is actuated by copper temperature, you can use the full capacity of transformers. Here is a new tool for effective load management of pole-type transformers.**

J-70793

YOU CAN BE SURE...IF IT'S

Westinghouse

Kent Walker, manager of Distribution, South Carolina Electric and Gas Company, and Ken Leland, Westinghouse Representative.

# PRODUCT NEWS

## New Designs and Applications

### Reel Rack

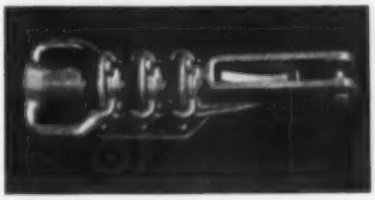
(1) *Weber Electric Mfg. Co., 15224 Kercheval Ave., Detroit 30, Mich.*

Four models of this new wire reel rack are available, a wall mounted type, two floor models and an undertable model. Advantages listed by the manufacturer include easy and fast handling, positive inventory control and space-saving overhead storage of other items. The wall model hangs on the wall at double reel height; one floor model can be set up anywhere and supports loads from both sides; a second floor model sets up anywhere but is loaded from only one side with lift truck or chain falls; the undertable model is 4 ft high and one or two reels deep.

### Drawout Switchgear

(2) *Federal Pacific Electric Co., Eastern Switchgear Division, 888 N. Keyser Ave., Scranton, Pa.*

Redesign of this company's low-voltage drawout switchgear has resulted in possible disconnection of primary breaker contacts with cell doors closed. With the circuit breaker in test position, the cell door can be closed by depressing the spring-loaded escutcheon plant less than 2 in. Dust problems are eliminated and installation, repair and maintenance of feeder circuits can be accomplished in complete safety, according to the manufacturer. Available in ratings from 15,000 to 75,000 amp interrupting capacity.



### Dead-end Clamp

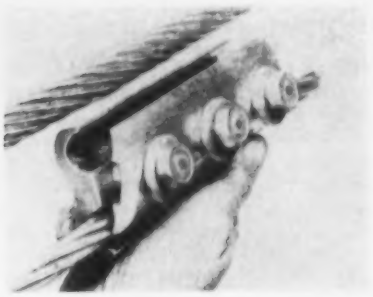
(3) *Bethea Co. Inc., Box 1407, Birmingham, Ala.*

What is said to be a new concept in design of straight line dead-end clamps is offered by this company. The body is inverted to give protection to the conductor, and the cable groove is straight to eliminate conductor distortion. The keeper drops down to permit entry of the conductor. It is reported that retightening of the nuts is unnecessary.

### Flexible Conduit

(4) *Columbia Cable & Electric Corp., 255 Chestnut St., Brooklyn, N. Y.*

A new type of liquidtight flexible electrical conduit is announced by this company. It is designed for installations outlined in Article 251 of the National Electric Code. It is a flexible galvanized steel conduit with a copper bonding strip wound spirally in the spaces between the convolutions. It is covered with an extruded vinyl plastic sheath.



### Aluminum Clamps

(5) *Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.*

A new line of clamps introduced by this company can be applied without being disassembled. Nuts have been eliminated. The parallel-groove design permits three clamps to cover the full range from No. 2 to 397.5 mcm ACSR, and from No. 2 to 400 mcm stranded aluminum conductor.

### Dry-Type Transformers

(6) *Acme Electric Corp., Cuba, N. Y.*

To meet demands for a single series of transformers for a wide range of outdoor and indoor installations, this company has developed a totally sealed, dry-type distribution transformer. The new series covers ratings of 5, 7.5 and 10 kva, single-phase 60 cycle; 9 and 15 kva, three-phase 60 cycle, in all standard voltages of 600 and below. It is reported that dust-free sealing eliminates the need for cleaning coils.

**Use Coupon for More Information . . .** . . . **See Page 32**

## Hydraulic Derrick

(7) *Truck Equipment Co., 3963 Walnut, Denver, Colo.*

Features of this new hydraulic derrick include 360° rotation and elevation to 15° to vertical. The unit will raise the load up to 40 ft above ground. Maximum lifting capacity in a vertical position is 20,000 lb and in a semihorizontal position is 3,000 lb. Hydraulic outrigger jacks extend to 16 ft from each side of the track to provide extra wide support footing. The derrick collapses to a length of 127 in. for transporting. Powered by a central hydraulic system that operates all movements of the derrick and winch.

## Arc Spinner

(8) *Westinghouse Electric Corp., Box 2278, Pittsburgh 30, Pa.*

A small doughnut-shaped magnet in lightning arresters of this company moves the arc to avoid pitting of electrode surfaces. The magnet is placed mechanically "in series" with the gap surface. When the arc is drawn, it is at right angles to the magnetic field and spins like the armature winding of an electric motor.

## Swing-Top Entrance Caps

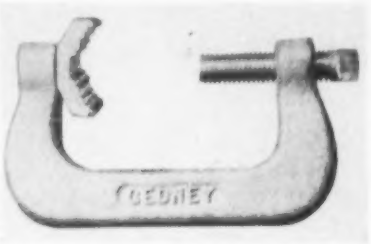
(9) *Electrical Fittings Corp., 37-50 57th St., Woodside 77, N. Y.*

Aluminum alloy is used to make this company's swing-top service entrance caps. The design features a hinged cap that swings out of the way during installation of wires. Attachment to conduit is by a pressure clamp.

## Conduit Brace

(10) *Coast Electric & Mfg. Co., 1733 N. E. Seventh Ave., Portland 12, Ore.*

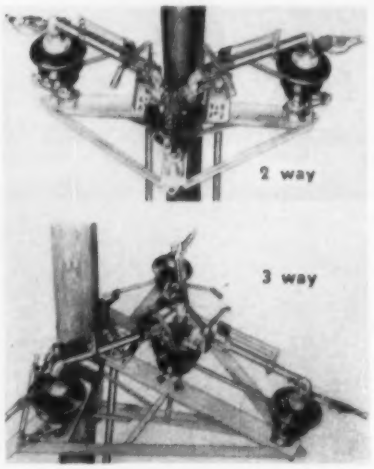
This company has developed a support for 2-in. conduit to meet needs created with the increasing use of 200-amp service. The metal brace fits between studding and has holes bored in it to hold the U-bolt that in turn holds the conduit. Predrilled to permit installation of conduit at any desired position between studs.




## Conduit Beam Clamps

(11) *Gedney Electric Co., RKO Bldg., New York 20, N. Y.*

These new conduit beam clamps with swivel base are made of malleable iron, cadmium plated, in two sizes. Two sizes will hold conduit sizes from ½ in. through 2 in.




## Air Break Switches

(12) *A. B. Chance Co., Centralia, Mo.*

Group-operated air break switches are new products of this company. They are designed for vertical phase-above-phase mounting on a single wood pole. Three insulator stacks per phase are required for two-way switches, and four stacks for three-way switches. The single pole mounting design gives advantages of lower initial costs, lower maintenance costs and minimum right-of-way requirements, it is reported.

SHALLORAMA, the new fixture designed by Sunbeam Lighting Co., was put to good use in the recently remodeled offices of M. A. Samuelson Co., a Los Angeles certified public accounting firm. The fixtures were utilized for general illumination throughout the offices. Stetson Electric Co., Los Angeles, was electrical contractor on remodeling project; Daniel Mann, Johnson & Mendenhall, architect

# FREE...

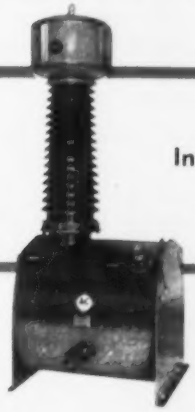
## New 24-Page Treatise on Instrument Transformers

### Available to Schools and Training Classes

UTILITY metering superintendents, industrial electrical engineers, switchboard builders — here's a desk-mate you will consult often and profitably. Instructors in engineering schools and on-the-job training programs — you will want to use this informative bulletin as a textbook. It's the most complete treatise ever compiled on the theory and operation of instrument transformers.

Included are comprehensive data presented in handy reference form, typical performance curves and a handy ratio-phase angle correction chart.

Single or quantity copies are yours for the asking. Write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

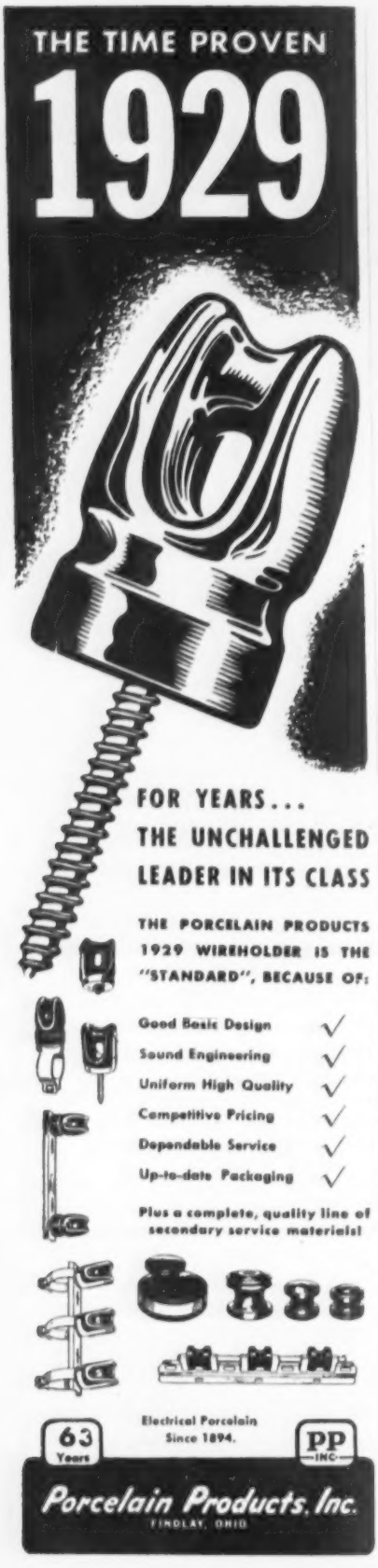


**Allis-Chalmers Instrument Transformers Available in Over 400 Ratings**

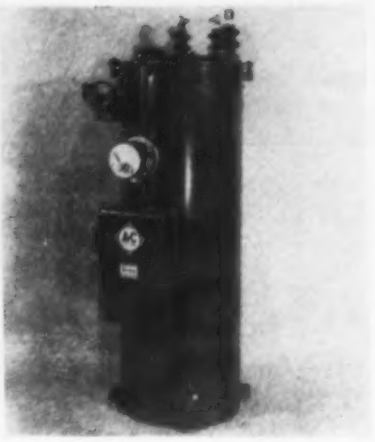
**Name the application.** There's an Allis-Chalmers instrument transformer that fills the bill precisely. Indoor, outdoor, dry-type, oil or compound-filled units — they are all available in the widest possible rating range.

# ALLIS-CHALMERS

A-5386



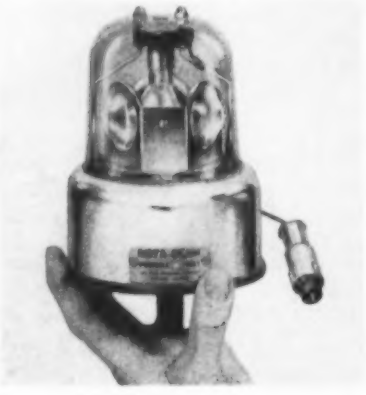




## Demand Meter Kit

(13) *Allis-Chalmers Mfg. Co., 1126 S. 70th St., Milwaukee 1, Wis.*

A demand meter kit for use by utilities in making load surveys on feeders has been announced by this company. Designed for mounting on distribution voltage regulators, the meter responds to the heating effect of the load in amperes—the limiting factor of the circuit capacity. A current transformer that steps up the control current to the desired meter current is mounted inside the meter.



## Warning Light

(14) *Pyle-National Co., 1334 N. Kostner Ave., Chicago 51, Ill.*

Available in 6-, 12- and 110-v models, this new warning light will plug into an auto cigarette lighter to provide emergency signals or, in the case of the 110-v unit, will operate on a regular household-type circuit. The 6- and 12-v model has a magnetized base for quick temporary mounting. A permanent mounting base is available.

## Hydraulic "Chore-Master"

(15) *Quick-Way Truck Shovel Co., Box 1800, Denver 1, Colo.*

The "Chore-Master" is a new hydraulic reaching, grading, digging attachment for crane-shovels. It is a telescoping boom that mounts on a special gantry and is interchangeable with standard attachments on "Quick-Way" cranes. The boom extends to a radius of 33 ft with the bucket open or retracts to a radius of 21 ft. All hydraulic actions are controlled by a single lever.

## Grounding Equipment

(16) *Schramm Inc., 810 E. Virginia Ave., Westchester, Pa.*

A combination of two pieces of compressed air equipment has reduced the time required in grounding an electric transmission line, reports this company. A self-propelled air compressor with a stake driver and pneumatic hammer attached is said to drive a 10-ft grounding rod in 30 seconds. Photo shows a ground rod held by self-releasing fingers on a guide bar. An 80-lb pneumatic hammer is being lowered to rest on top of the rod to exert pressure. A combination of hammer action and hydraulic pressure drives the rod.

## PAR-64 Fixture

(17) *Steber Mfg. Co., Broadview, Ill.*

A new Steberlite for PAR-64, 500-w sealed-beam lamps is now available. The unit is constructed of cast aluminum with heat radiating fins for maximum dissipation of heat. Equipped with weatherproof universal joint and built-in aiming clip. Various arrangements and sizes of mounting arms are available. Catalog sheet available.

**Hotsticks**

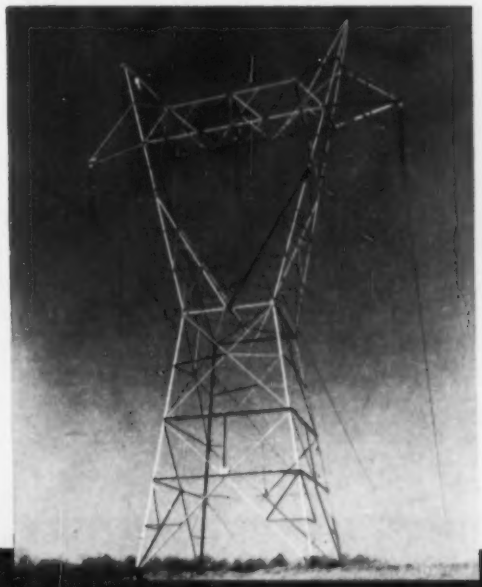
(18) *Burndy Corp., Norwalk, Conn.*

Insulating handles known as HH5 Hotsticks are available to adapt the Y35 Hypress hydraulic tool for hot line work. The new handles are interchangeable with standard handles of the Y35 Hypress, which is used to install compression connectors on copper, aluminum and ACSR cable.

**Stringing Sheave**

(19) *Sherman & Reilly Inc., First and Broad St., Chattanooga 2, Tenn.*

Greater ease and speed of mounting, positive locking, light weight and low cost are stated features of this improved stringing sheave. An improved adjustable aluminum alloy bracket accommodates all crossarms 5 in. wide or smaller and mounts either on roofed or flat crossarms.

ONE COAT OF SUBOX PROTECTS GALVANIZED TOWERS FOR 5 TO 8 YEARS

Indeed, a coat of Subox paint often lasts more than eight years . . . and usually without any chipping, cracking, peeling or blistering.

Subox paints are the only American paints made with lead-suboxide. A colloidal pigment, it assures maximum surface penetration . . . packs to form a dense, impervious coating. Furthermore, being *chemically active*, lead-suboxide *actually works* to strengthen and reinforce the film.

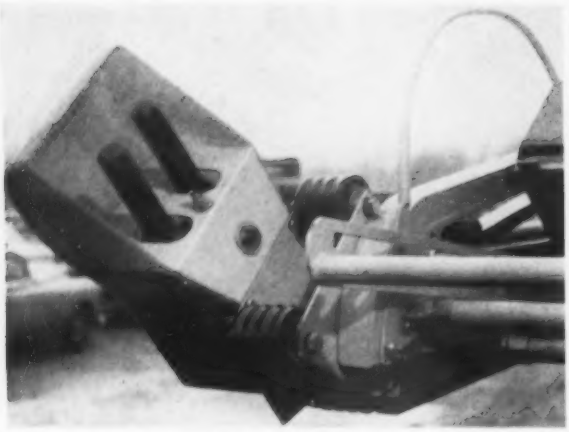
Subox paints have been proved under the severest conditions and are used more widely than any other paints for the protection of galvanized towers. Available in attractive modern colors.

Write for brochure: "Corrosion Control of Electrical Structures and Equipment."

SUBOX PAINTS

Subox Inc.

*Established 1924*
18 Fairmount Plant
Hackensack, N. J.



### Ladder Controls

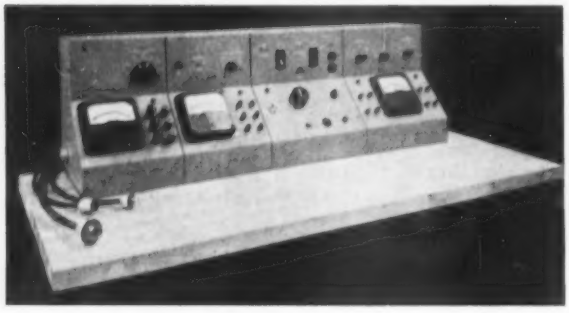
(20) *J. H. Holan Corp.*, 4100 W. 150*th St., Cleveland* 11, *Ohio*

This new aerial ladder can be raised, lowered and rotated by remote platform controls (see photo). It is an adaptation of the company's series 2100 all-hydraulic ladder with the ground or platform control feature added. Controlling includes accurate spotting, throttling and speed in 360° rotation and to a 75° angle. Available with maximum ground-to-platform heights of 27, 31 or 35 ft.

### Underwater TV Camera

(21) *Hancock Electronics Corp., 2553 Middlefield Rd., Redwood City, Calif.*

Visual inspection of dams, spillways, turbine blades and other underwater facilities and equipment is possible with a new underwater, closed-circuit television system now available. The system consists of a new, ultrasensitive TV camera mounted in a watertight steel cylinder. Control of the camera is from the remote viewing screen.



### Calibrating Sets

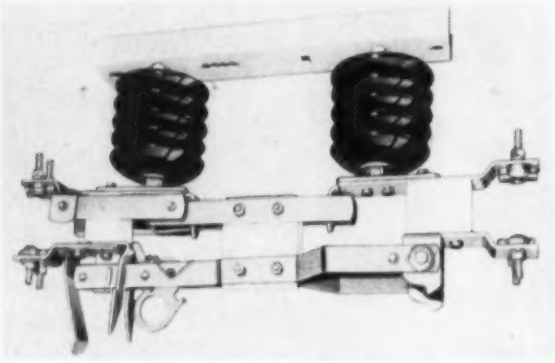
(22) *Multi-Amp Corp., 465 Lehigh Ave., Union, N. J.*

This company is now producing calibration sets for electric utility laboratory use. The bench tests sets are reported to meet the most exacting laboratory standards for testing and calibrating field instruments, including a-c and d-c voltmeters, ammeters, milliammeters, etc. Composed of four separately housed sections, comprising an adjustable power source with line cords and three independent sections.

### Air Circuit Breaker

(23) *Federal Pacific Electric Co., Eastern Switchgear Division, 888 N. Keyser Ave., Scranton, Pa.*

Hinged arc chutes, a simplified racking-in mechanism and a new type zirconium refractory baffle are among the features of a 500-mva, 15-kv, 5-cycle type DST air circuit breaker announced by this company. Interruption, effected in five cycles or less, is accomplished by the principle of arc elongation and cooling. A single large puffer serves all three phases and provides fast arc extinction at low currents.



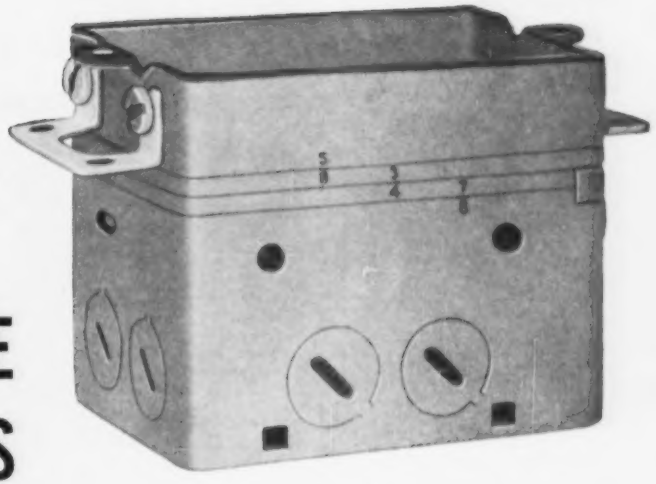
### Regulator By-pass Switch

(24) *Line Material Industries, 700 W. Michigan St., Milwaukee* 1, *Wis.*

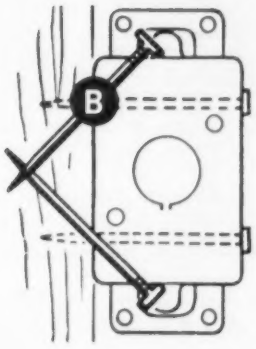
With a dual rating of 400 amp at 7.8 kv and 200 amp at 15 kv, this new voltage regulator by-pass switch replaces three disconnect switches. It is applicable to regulators that can be set in a neutral position. The company reports that coordinated blade movement insures shunting of the regulator before separation of main contacts.

# NOW!

## NON-GANGABLE SWITCH BOXES

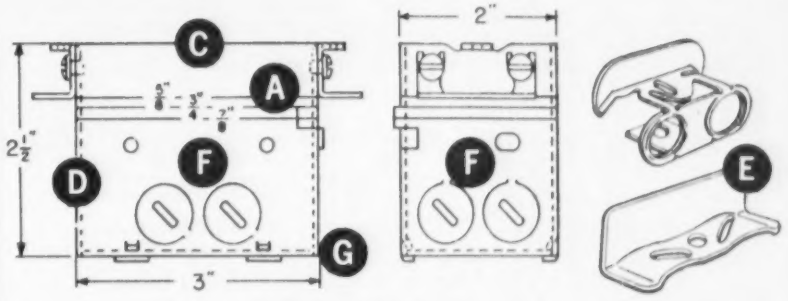


## Join the National Electric "Redege" Line




**11 NG series**
for non-metallic sheathed and flexible cable

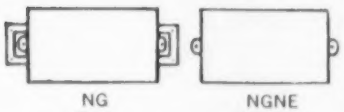
**12 NG series**
for armored cable and flexsteel conduit



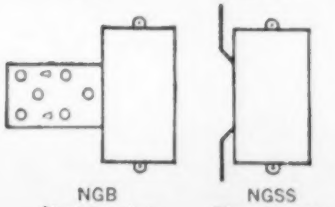

### Check these features:

- **A** Plaster line gradation marking on the box
- **B** Diagonal and through nail holes
- **C** Plenty of capacity (12.8 cubic inches)
- **D** 14 gauge electro-galvanized steel
- **E** 2 cable clamps (each type)
- **F** 2 pri-outs—each end and each side
- **G** Square corners

4 Combinations Available



NG Ears — NGNE No Ears



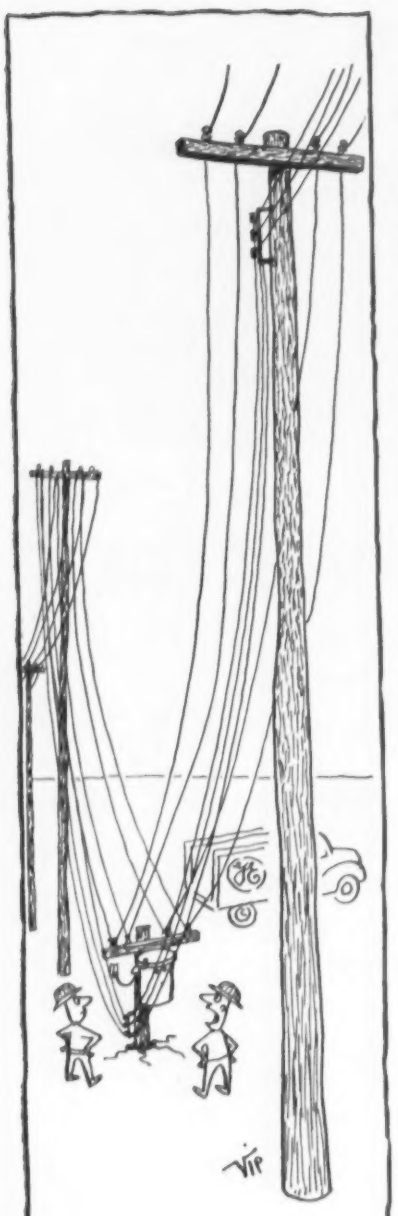
NGB Stud Bracket — NGSS Strap Bracket

| Cat. No. | Cat. No. | Type | Sides | KO | Cable Pri-Outs | Wgt. Per C | Std. Pkg. |
|---|---|---|---|---|---|---|---|
| 11NG | 12NG | Ears | Straight | 1—½" KO in Bottom of Box | 2—21/32" in each Side and End | 74 | 50 |
| 11NGNE | 12NGNE | No Ears | Straight | | | 70 | 50 |
| 11NGB | 12NGB | Bracket | Straight | | | 88 | 50 |
| 11NGSS | 12NGSS | Strap Brac | Straight | | | 84 | 50 |

Listed by Underwriters' Laboratories Inc.
Stocked by Leading Distributors everywhere.

**National Electric Products**

PITTSBURGH, PA.
2 Plants • 12 Warehouses • 41 Sales Offices



"I guess you'll have to uprate it; it must have been carrying more than its load!"

Do you have overloaded distribution transformers? Call a General Electric Apparatus Service Shop. The shop can uprate your old transformers in both kva and voltage for about two-thirds the cost of new transformers . . . can also convert to self-protected type. And you get new-transformer warranties. Call your G-E Apparatus Service Shop or Sales Office.

431-57

*Progress Is Our Most Important Product*

GENERAL ELECTRIC

# *BULLETINS ETC.*

(25) **CONDENSER BUSHINGS**—Ohio Brass Co., Mansfield, Ohio, has published a booklet giving full technical data on class LK and GK condenser bushings. Besides helpful technical information, the book carries the story on how the bushings are designed and built.

(26) **TREATED POLES**—A new handbook on pressure-treated timber poles is now available from the American Wood Preservers' Institute, 1410 S.W. Morrison, Portland 5, Ore. Contains data on service life, designs of buildings, recommended preservatives and treatments, and also formulas on working stresses and wind loads.

(27) **MOVIE**—Aluminum is spectacularly presented in a role as the "chameleon of metals" in a color and sound motion picture available on loan from Aluminum Co. of America, Motion Picture Section, 1501 Alcoa Bldg., Pittsburgh 19, Pa. It illustrates aluminum's versatile color and texture possibilities to designers, architects and engineers.

(28) **RECLOSER**—Catalog CR1W, describing the new 200-mva Kyle type W oil circuit recloser, is now available from Line Material Industries, 700 W. Michigan St., Milwaukee 1, Wis. Illustrated with graphs, charts and tables.

(29) **STAGE LIGHTING**—Bulletin SL-56 of Hub Electric Co., 2255 W. Grand Ave., Chicago 12, Ill., is a technical publication devoted to school stage lighting and control. It presents a set of design procedures applicable to problems in a generally unfamiliar but growing field.

(30) **SUBSTATION CONSTRUCTION**—The use of standardized, modular trusses and small parts for the fabrication of electrical transmission substations is pictured and described in an eight-page brochure published by Charles E. Schuler Engineering Co., Newark, Ohio.

(31) **USES OF ALUMINUM**—Uses of aluminum in electrical systems are illustrated in a new brochure published by Reynolds Metals Co., 2500 S. Third St., Louisville, Ky. The brochure is of special interest to wire and cable buyers, featuring detailed information on ACSR and covered aluminum conductor.

(32) **INSULATION**—Ehret Magnesia Mfg. Co., Valley Forge, Pa., has published a bulletin covering the company's line of calcium silicate insulations for temperatures up to 1,200 F. It gives basic sizes of insulation for pipe covering and block for application in the power and process industries.

(33) **TRANSFORMER MAINTENANCE**—A new 50-page booklet entitled "Timely Tips on Transformer Maintenance" is available from Westinghouse Electric Corp. It discusses transformers and their maintenance and includes such subjects as general inspection procedures, classification of transformers, methods of drying out and transformer connections. Ask for B-4716-B. Write to the company at Box 2099, Pittsburgh 30, Pa.

(34) **MOTOR CONTROL**—A completely designed general purpose motor control center that is said to save up to 50% floor area is the subject of a bulletin released by General Electric's distribution assemblies department. Ask for GEA-6367A. Write to Advertising & Sales Promotion, Distribution Assemblies Department, General Electric Co., Plainville, Conn.

(35) **CAPACITORS**—New indoor low-voltage, dustproof capacitors and equipment are described in bulletin PC8 of Line Material Industries, 700 W. Michigan St., Milwaukee 1, Wis.

**KILL TWO BIRDS WITH ONE STONE—Fill out this coupon and get back valuable information from as many sources as you indicate.**

**ELECTRICAL WEST**
**68 Post St., San Francisco 4, Calif.**

***Not good after August 1***

Please send me, without obligation, the new product information or catalogs:

**If described in Product News, circle item number**

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35

**If described in advertising, fill in page number**

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

NAME ..... TITLE .....

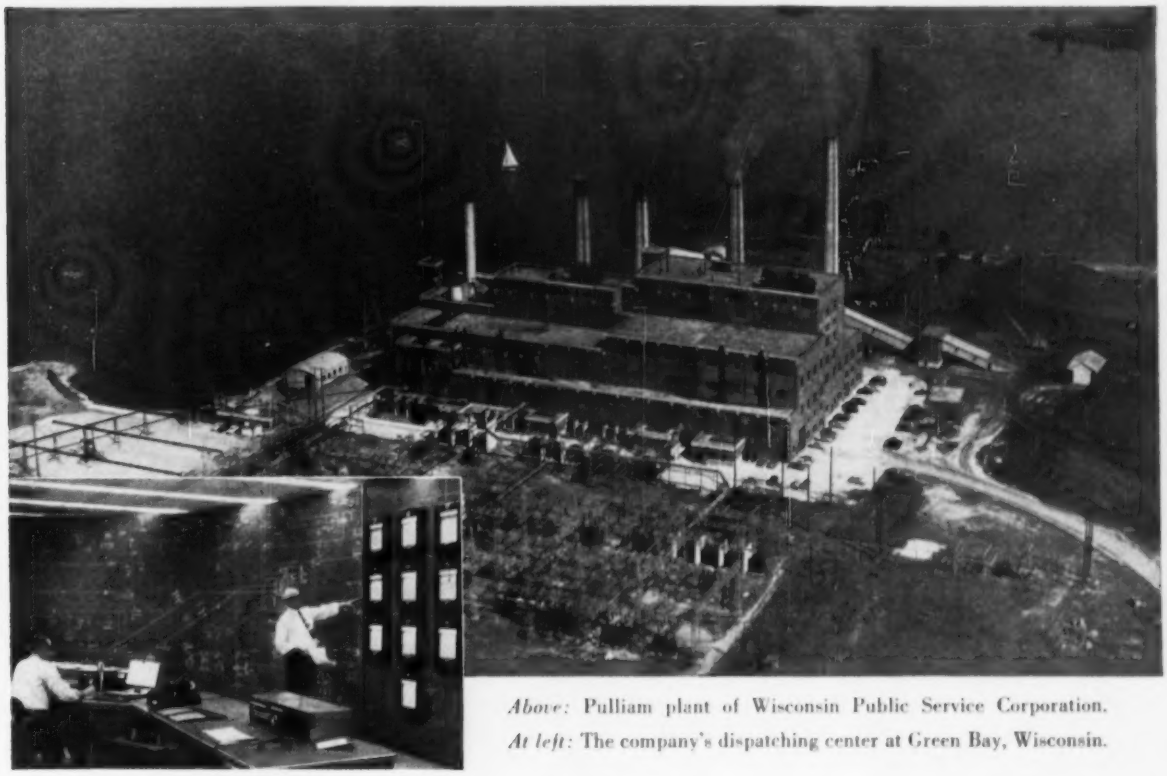
COMPANY .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

*Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

**BELL SYSTEM PRIVATE LINE CHANNELS SERVE THE POWER INDUSTRY**



*Above:* Pulliam plant of Wisconsin Public Service Corporation.
*At left:* The company's dispatching center at Green Bay, Wisconsin.

# Why Wisconsin Public Service gets better communications for less money

Until a few years ago Wisconsin Public Service Corporation provided most of its own communications services. But the company was growing fast. As its communication needs increased, WPS asked Bell System engineers to study the overall problem.

As a result, the power company reached the following conclusions:

1. It would cost less to lease Bell System services than to carry the charges on current and proposed communications facilities.

2. WPS technicians who had always been tied to communications assignments could be released for vital jobs in generating, transmitting and distributing power.

3. Expansion would be simpler; equipment would be kept up to date.

4. Telephone transmission would be reliable and of high quality.

Now Wisconsin Public Service has one of the most modern communication systems in the power industry. The company uses private line telephone for centralized load dispatching and private line channels for remote metering, protective relay and supervisory control.

***A Bell System representative stands ready to study your communications needs—and to work with you in developing faster, more efficient communications. Just call your Bell Telephone business office.***

BELL TELEPHONE SYSTEM

PRIVATE LINE TELEPHONE • PRIVATE LINE TELETYPEWRITER • DATA TRANSMISSION SYSTEMS
CHANNELS FOR: REMOTE METERING AND CONTROL • TELEPHOTOGRAPH • CLOSED CIRCUIT TV

# Tear up

## those old cost estimates!

The low prices of the new Copperweld* Type M Guy Strand make your old cost estimates out-of-date! Copperweld has always given you more years of service per dollar of cost. Now, prices on Type M Guy Strand make first cost lower and more attractive.

Basically, the principle of the new Type M Guy Strand is still the same—each wire has a heavy copper sheath inseparably molten-welded to an alloy steel core. Lower prices result from a new higher strength strand developed by Copperweld research, and from new specialized guy strand production techniques.

Type M Guy Strand is available in 2.2M, 4M, 6M, 8M, 10M, 12.5M and 16M strengths. It is pliable—easy to install. And, because of the molten-weld, the copper will not crack, flake or peel. Write today for complete details about this money-saving product.

*Trade Mark

COPPERWELD STEEL COMPANY
WIRE AND CABLE DIVISION *Glassport, Pa.*
For Export: COPPERWELD STEEL INTERNATIONAL COMPANY, New York

GET THE FACTS ON

*New* Copperweld TRADE MARK

COPPER MOLTEN-WELDED TO STEEL

TYPE M GUY STRAND

JUNE 1957

# ELECTRICAL WEST SALES GUIDE News Letter

FOR THE ELECTRICAL MERCHANT OF THE WEST

Saves Dollars

Saves Dollars was the theme of a May electric range promotion sponsored by Northern California Electrical Bureau and featuring specials and prize inducements. For customers who cook or heat water with fuels competitive to PG and E service, there was an added incentive—a bonus trade-in allowance of $30 on the purchase of a range and $20 on an electric water heater to replace bottled gas equipment. NCEB provided colorful window banners and brilliant fluorescent jumbo price tags calling attention to the May electric range special.

Use Wire Instead

"Use wire instead of fire" is the catchy title of Tacoma City Light's current range and water heater campaign. The utility will pay $50 toward the cost of wiring when a flame-type water heater and range are replaced or when an electric side-arm is replaced with an automatic unit in conjunction with a range. If only one piece of equipment is replaced, the allowance is reduced to $20. A similar campaign last year brought in about $140,000 worth of new business for electricians, plumbers and dealers, according to T. Ivan Usher, City Light community relations manager.

Calling all rhymesters

Sacramento has given a new slant to this year's electric range contest—fifth annual to be conducted by the Sacramento Valley Electric League and SMUD. Instead of completing a statement, contestants are asked to complete a jingle, then give three reasons for wanting an electric range. Deadline is June 30; prizes, 12 ranges. A separate contest for salesmen will give points on unit sales of specific ranges—those of manufacturers matching SMUD's contribution to the prize pool. Here's the jingle the public is asked to finish: "The electric range is for me/It's cleaner and cooler, you see/It's flameless and thrifty/So pretty and nifty,"

In San Diego its housewares

San Diego dealer windows were all dressed up last month for the annual contest sponsored by the bureau's Electric Housewares Division. In addition to display materials of Look magazine and EEI each window had the new colored lamps in all sizes. As a traffic builder stores conducted guessing contests on lamp wattages.

**Twenty-five years old**

San Diego Bureau of Home Appliances will celebrate its silver anniversary on Sept. 26 with a big party at the El Cortez Hotel. All past presidents are on the arrangements committee, which is headed by Harry E. Callaway, chairman, and E. W. Meise, vice-chairman.

**Bulb bath**

In promoting the recent Breakfasters Lion Club's door-to-door light bulb sale at Las Vegas, Southern Nevada Power named a Miss Bright Light, photographed her taking a luxurious bulb bath. It gave away electric toasters as an added incentive to lamp sales.

**A good boost for commercial cooking**

Utah Power & Light has issued another in its series of commercial electric cooking mailers. These attractive two-color folders open up to a 22x17-in. sheet, making an impressive pictorial presentation of up-to-date installations in firms served by Utah P&L and Western Colorado Power. They are sent out by J. Homer Shaw.

**Lunch date**

Tucson Appliance Merchandisers Assn. has changed from evening to luncheon meetings. There will be one a month, keeping to a 12-1:30 schedule and with the luncheon tab included on quarterly statements. First luncheon group heard Former Congressman Harold Patten, who gave revealing insights into methods used to influence votes.

**Day at the Mart**

A special "Day at the Mart" is being planned for Wednesday, July 24 at the Summer Market in San Francisco. There will be "preview" showings and a drawing to encourage attendance at appliance, radio and TV spaces. Drawing prize will be a trip to Hawaii for two. As an added Mart attraction this year, the Retail Furniture Assn. is conducting an advertising sales clinic.

**Accepted too readily**

"We in the Pacific Northwest's utility industry have accepted a little too readily the obsolete engineering formulas which put electric heat in the higher-cost 'premium' class for home use, Harold Wright of Washington Water Power told the NELPA Business Development Conference at Vancouver (see p 148). He told of a recent survey on the WWP system proving that, properly designed and installed, electric units will give satisfaction at competitive or lower cost than other fuels; called for teamwork on a system of uniform design and installation practices.

**More on heat**

Another Northwest spokesman, C. W. Brissenden of PGE, told the Portland convention of the Oil Heat Institute, Pacific Coast Division, that there were 300,000 electrically heated homes at the end of 1956 and by 1965 3.3% of all homes will be so equipped. New furnace installations in Portland last year, he said, were divided: oil 46%; gas 36%; electric 17%; solid fuels 1%.

**A first in Hawaii**

Home improvement was the theme for Hawaii's first home show, held in Kaiser Dome auditorium in Honolulu, May 3-5 and sponsored by the Home Builders Assn. Thirty displays were seen by approximately 20,000 (Dome capacity, 2,000) in the three days. Hawaiian Electric coordinated and participated in all displays showing electric appliances. Company home economists conducted all cooking demonstrations.

**A show at Medford**

Medford's home show was held May 30-June 2 while this issue was on the press. California Oregon Power Co.'s exhibit at this show was institutional, showing what the utility does to serve the home owner. A system map, with plant locations, and a graph indicating increase in capacity during the past few years were included. The exhibit will be shown also at the Roseburg County Fair.

**And in southern California**

Southern California also had its home shows last month—in Orange County and at Los Angeles. Among the displays at the former were those set up by Bob Hallberg of G-E Appliances in his own booth and that of Southern California Edison and in the Edison booth by E. R. McConner, Frigidaire, J. P. McMahon, Thermador, and Carl Benson, Touch-Plate Mfg. Co.

**Changes at Puget Power**

A major change in organization of Puget Sound Power & Light's sales department abolished the position of general sales manager and set up sales directors reporting to R. F. Plymire, vice-president. It also created two new jobs. Clarence Scheyer moved from general sales manager to the post of local manager at Puyallup, a fast-growing and important section in the southern division. The new positions, residential sales director and chief rate engineer, went to Al Couch and Leo Aaltonen, respectively. The other sales directors are Ken Hollingsworth, commercial, and Edith Rauch, home service. All are quartered in the company's new Bellevue head office. Couch went into the staff job from division sales manager at Bellingham. He was succeeded there by Mickey McDonald, formerly at Bremerton. Wilbur Farsje, a former sales supervisor, took the sales manager's post at Bremerton.

**Spring promotions**

Sales representatives of J. C. Ceazan, southern California distributor for Easy and Gibson, may well rank among the list of best dressed men as a result of the company's "Dig for Duds" spring promotion. For every sale of a Gibson appliance retail salesmen are being given the choice of one of eight packages in a clothing line. Gibson wholesalers have the same choice for every three items they sell. Ceazan also has a "Dollars for Display" promotion on both lines.

Frank Falge's monthly progress report on

# LIVE BETTER . . . *Electrically*

---

Rock and roll with LBE

Copper to carry the electricity to help us Live Better...Electrically comes from the mines at Butte, Mont. Montana Power Co. reports that one of their hard-rock copper miners came in for a copy of the Live Better...Electrically sheet of music that he had heard on the power company's TV program—said he wanted to amuse the other miners by playing the jingle on his mandolin.

How long to the dump?

Refrigerators move from the retailer's store to the scrap heap in 12 years whereas automobiles, even though they have wheels, make the trip in 13, says the Institute of Scrap Iron & Steel. Washing machines and ironers take five years.

And now for the home

Homes are being automated, too. For $1,500 Agri-Tect Co. of Johnston, Ohio, will provide all the equipment to mount your second floor on a circular track so that you can enjoy the sun or the breeze electrically and effortlessly.

Whiskers vs kilowatts

Remington-Rand, maker of electronic brains as well as shavers, got its big machine to work and it came up with the answer that its razors whisk away 600,000,000,000 (yes, that's billions) of whiskers a day. We'd like to ask them to ask the machine how many kilowatts that requires.

Could be embarassing

Recently Bell Telephone Lab announced it had perfected a working model of a "seeing telephone." Says Mr. Kappel, president of AT&T, "I believe person-to-person TV will come. With equipment available right now we're trying out a home communication system that will handle calls the usual way, enable you to talk to any other phone in the house and permit you to answer the door by telephone."

Seeing is believing

Live Better...Electrically is being talked about and being read about. In February a check of ad linage incorporating the Live Better...Electrically symbol or slogan in newspapers showed a grand total of 5,396,993 lines—utilities, 2,468,634; dealers, 2,844,718 lines.

A new textbook on

Electrical Planning for Today's Homes, a complete teaching plan including project sheets and questions and answers for student use is an excellent 8-page textbook put out by National Adequate Wiring Bureau, 155 E. 44th St., N. Y.

HOUSEPOWER

Monday, May 20, 1957
Fluor awarded AEC contract for new atomic concept
The Fluor Corporation, Ltd., Los Angeles engineering-construction firm, has been awarded a research and development contract by the United States Atomic Energy Commission to develop and test special forms of uranium, thorium, and other nuclear fuels suitable for use in a new power reactor design. The design involves the use of flowing solid particles for nuclear fuels.
The new concept is an outgrowth of research carried on by Fluor's Research Division, and has been under study by Fluor for more than a year without financial assistance from the AEC.

# **Creative Challenge:** *A new power reactor system offering greater economy, higher operating temperatures, lower reactor pressures, and reduced corrosion.*

In August 1955 a concept of using flowing solid particles for nuclear fuels was originated by a group of Fluor engineers.

Upon receiving a preliminary findings report, Fluor management, convinced of the importance of the proposed process, initiated a full scale, company sponsored study of the process. A patent application was filed by M. R. Dusbabek and F. L. Johns, engineers responsible for project. Over five months of developmental tests and studies followed.

The findings of the Fluor studies were offered to the Atomic Energy Commission for evaluation. In March 1957 the AEC awarded a contract to Fluor based on the original studies.

The Fluor Corporation, Ltd. is particularly proud of this contract because it represents a Fluor ideal . . . *creative imagination coupled with scientific ability holds the key to America's industrial future.*

**FLUOR** *ENGINEERS AND CONSTRUCTORS*
*for the Petroleum, Chemical and Power Industries*

*The FLUOR CORPORATION, Ltd., Los Angeles – Mid-Continent Division, Houston – Research Division, Whittier, California – Fluor of Canada, Ltd., Toronto – Singmaster & Breyer, Inc., New York City*

# NOW...SANGAMO SECONDARY CAPACITORS!

## to release transformer capacity, reduce losses, and improve voltage levels on secondary circuits

**Small in size**
**Light in weight**
**Easy to handle**
**Easy to mount**

Sangamo secondary voltage rated capacitors are built with the same processing care and to the same high standards that have put Sangamo Diaclor Primary Capacitors on the "approved list" of most major utilities in two short years. They are built to distribution engineer's specifications—with *all the features you want* to meet your service requirements.

**CORROSION-RESISTANCE THAT'S MORE THAN SKIN DEEP**—Cylindrical cases are of all welded steel construction, with mounting supports brazed to the case. There are no pockets to accumulate dirt or moisture. Tin plating, aluminum metallizing and two coats of baked vinyl resin base paint provide corrosion resistance even when case is scratched.

**CYLINDRICAL DESIGN WITH HIGH PURITY KRAFT PAPER AND ALUMINUM FOIL**—Provides an efficient unit with minimum weight and size. Elimination of foil tabs prevents possible injury to paper.

**SPECIAL DIACLOR IMPREGNATION FOR STABILITY OVER A WIDE TEMPERATURE RANGE**—These capacitors operate at temperatures from −40°C to +46°C.

**INTERNAL DISCHARGE RESISTOR TO PROTECT LINEMEN**—Reduces residual voltage to 50 volts or less in one minute.

**PERMANENT HERMETIC SEAL WITH SOLDER SEALED BUSHINGS**—Wet process porcelain bushings, metal bonded to the case, provide gasketless seal. Clamp type terminals are of tinned copper alloy, can be used with any type of conductor.

**UPRIGHT OR INVERTED SWIVEL MOUNTING**—Enables best utilization of available pole space.

**Order from your Sangamo Representative, or write us for complete information and prices.**

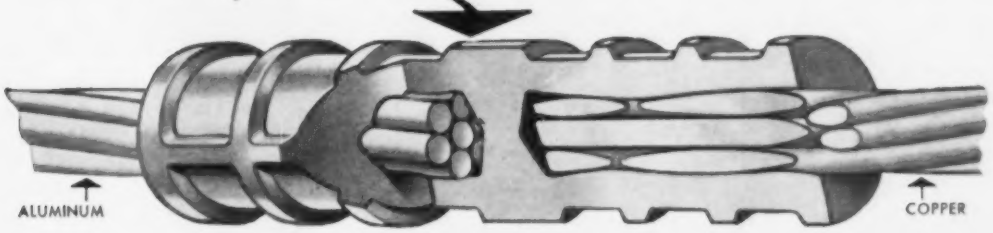
**240 VOLTS, 60 CYCLE, SINGLE-PHASE**

| Size | Diameter | Overall Height | Net Weight |
|---|---|---|---|
| 3 KVAR | 5-7/16" | 15-3/8" | 18 lbs. |
| 5 KVAR | 5-7/16" | 21-3/8" | 28 lbs. |

FC57-2A

**SANGAMO ELECTRIC COMPANY**
**SPRINGFIELD, ILLINOIS**

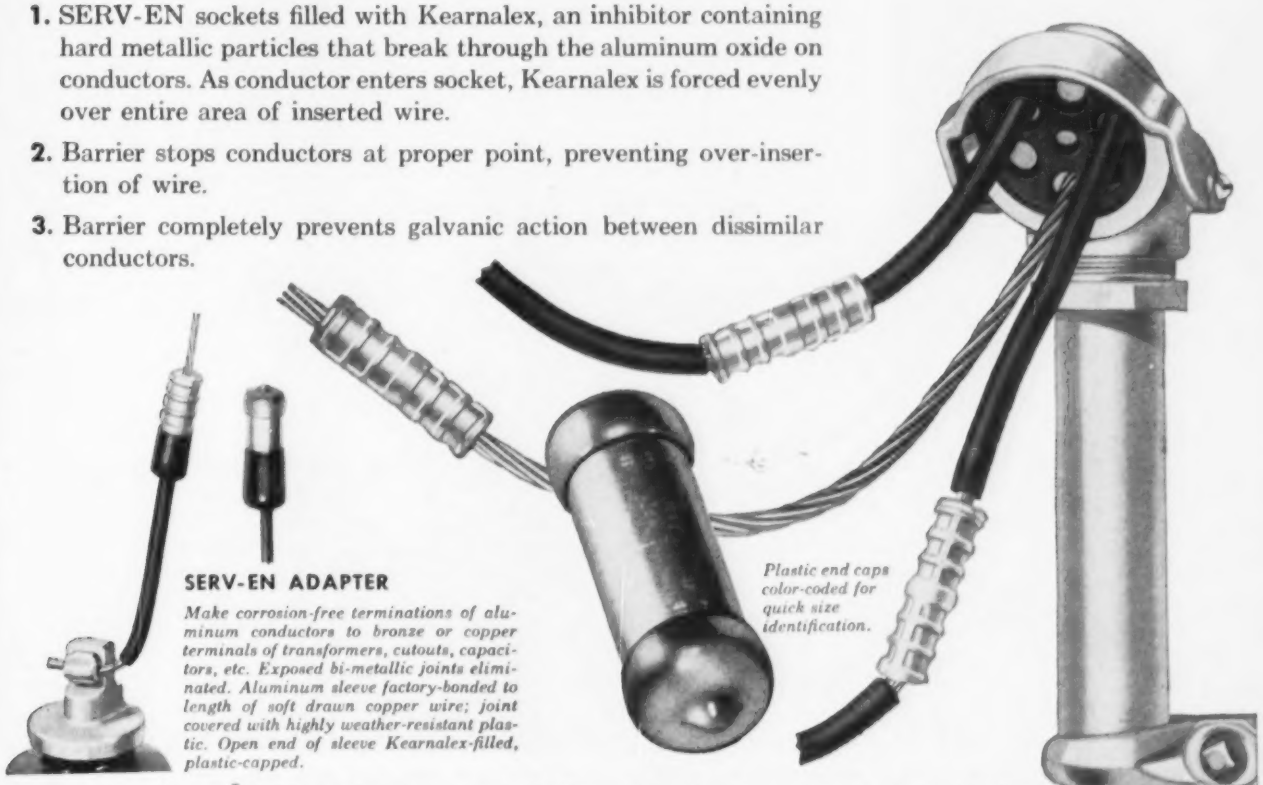
# the barrier that gives you 3 definite advantages




# in KEARNEY SERV-ENS
## SERVICE ENTRANCE SLEEVES

***—outstanding compression connectors for splicing all combinations of ACSR, aluminum and copper for service entrances***

1. SERV-EN sockets filled with Kearnalex, an inhibitor containing hard metallic particles that break through the aluminum oxide on conductors. As conductor enters socket, Kearnalex is forced evenly over entire area of inserted wire.
2. Barrier stops conductors at proper point, preventing over-insertion of wire.
3. Barrier completely prevents galvanic action between dissimilar conductors.



**SERV-EN ADAPTER**

*Make corrosion-free terminations of aluminum conductors to bronze or copper terminals of transformers, cutouts, capacitors, etc. Exposed bi-metallic joints eliminated. Aluminum sleeve factory-bonded to length of soft drawn copper wire; joint covered with highly weather-resistant plastic. Open end of sleeve Kearnalex-filled, plastic-capped.*

*Plastic end caps color-coded for quick size identification.*

**JAMES R. KEARNEY CORPORATION** • ***General Offices:*** **4224-42 Clayton Ave., St. Louis 10, Mo.**

**IN THE WEST:** for prompt service, contact Kearney's West Coast Distributor, **Maydwell and Hartzell, Inc.,**
Los Angeles • Seattle • Portland • San Francisco • Spokane • Phoenix.

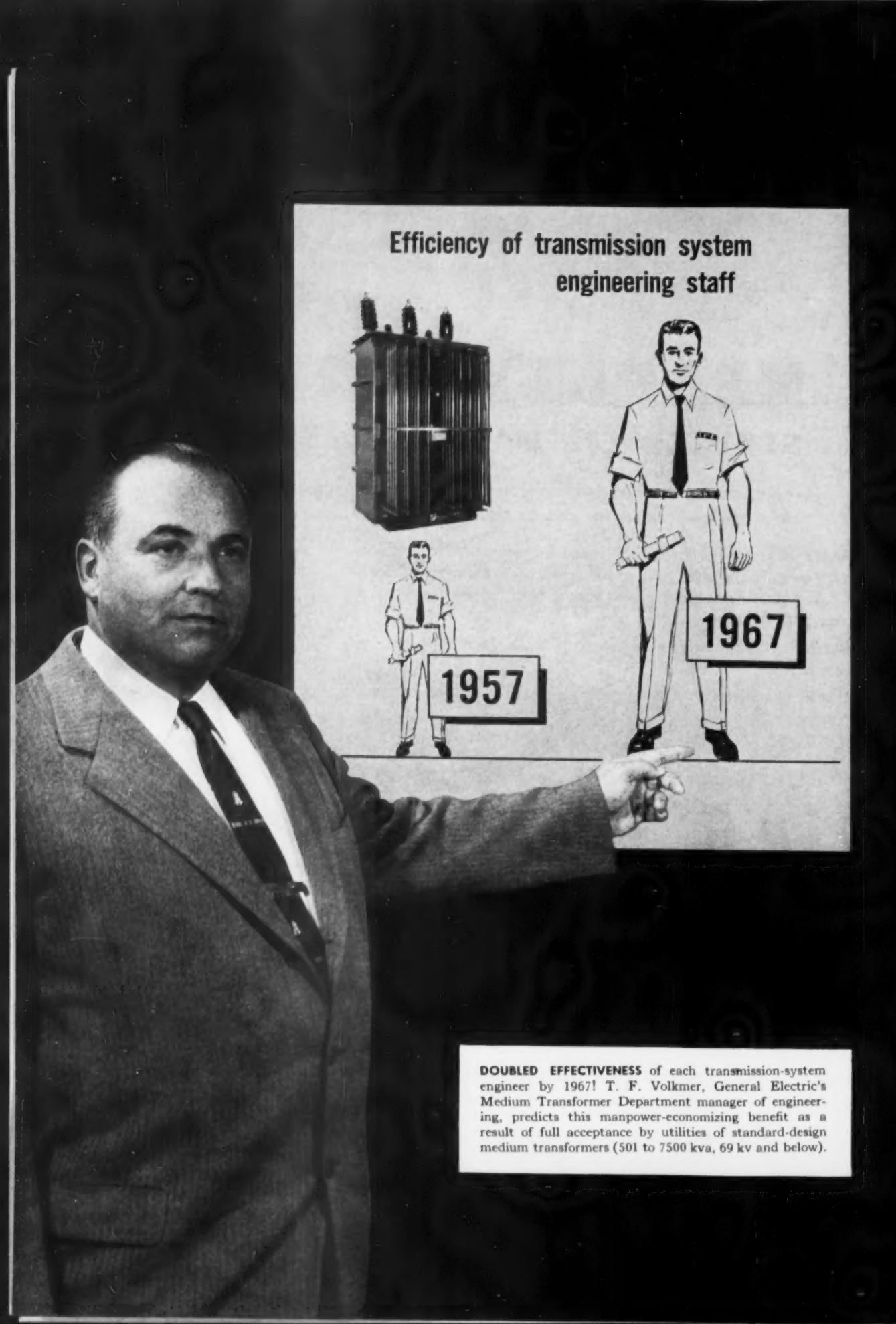
366-W

**for BETTER CONSTRUCTION**
**SAFER MAINTENANCE**

*Specify* **KEARNEY PRODUCTS**

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO. QUEBEC, ONT.

*The Mark of Quality*




**DOUBLED EFFECTIVENESS** of each transmission-system engineer by 1967! T. F. Volkmer, General Electric's Medium Transformer Department manager of engineering, predicts this manpower-economizing benefit as a result of full acceptance by utilities of standard-design medium transformers (501 to 7500 kva, 69 kv and below).

***A GENERAL ELECTRIC 10-YEAR FORECAST:***

# Medium transformer standardization to double efficiency of transmission-system engineers

In 1967, electric utilities' transmission-system engineers will be largely relieved of medium-transformer design details; one man in this field will be as productive as are two today. Engineers will thus be freed for more challenging work, and utilities will be able to meet the future's heavier technical needs with fewer engineers than would otherwise be required. So forecasts T. F. Volkmer, manager of engineering at General Electric's Medium Transformer Department in Rome, Georgia.

What will make this greater productivity possible? This: utilities' continued acceptance and application of standard-design transformers. For, when standard-design units are adopted for all systems, only the most basic information (such as kva, high-voltage, and low-voltage ratings) will be needed to specify additional transformers. This simplified ordering procedure will relieve your valuable engineering personnel of time-consuming details of transformer design and specification.

## YOU GET REAL BENEFITS TODAY!

You can realize the benefits of simplified ordering and reduced design time, *now*, by specifying General Electric RM (Repetitive Manufacture) transformers. These standard-design units also offer:

**Faster shipment**—Ten-week shipment is now average for General Electric RM medium transformers. This compares with an industry average of more than 16 weeks for specials.

**More and better features**—Standard design makes it economically possible for G.E. to offer such extras as Formex* insulated windings, control-center arrangement of instruments and accessories, reversible junction boxes, and many others.

**Higher quality for longer life**—G-E repetitive manufacture techniques permit 18 assembly-line tests and 22 quality-control inspections during manufacture, to assure dependable operation over a long service life.

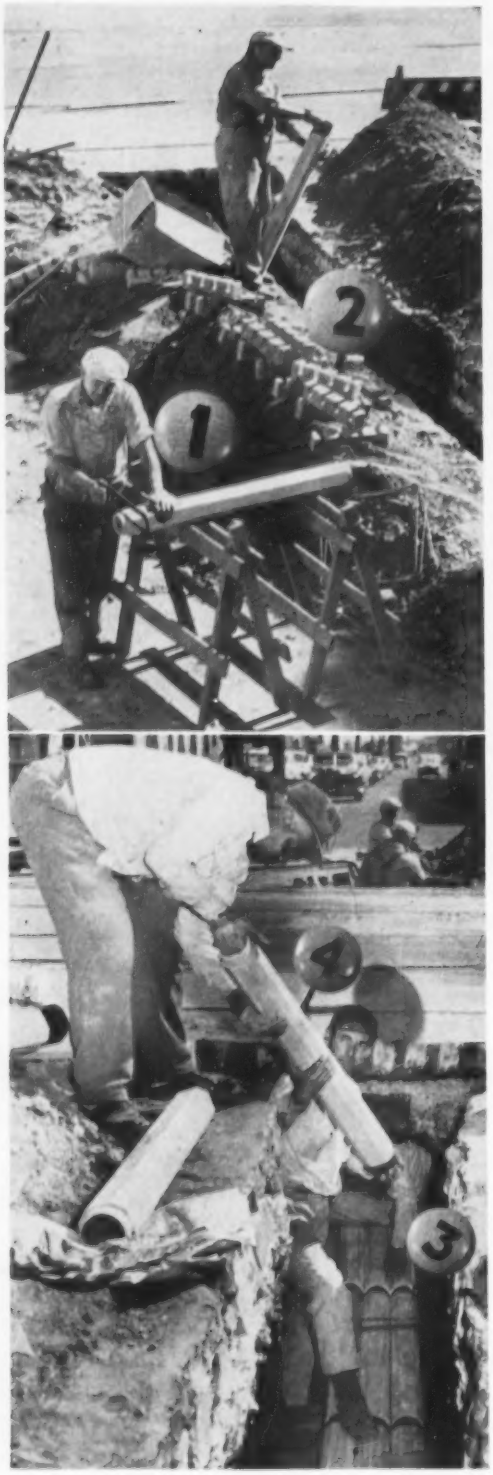
## G.E.'S BROAD RANGE OF STANDARDS HANDLES 90% OF ALL JOBS

If your company is not yet taking full advantage of the benefits of medium transformer standardization, act today. Ask your G-E Apparatus Sales Engineer to show you how G.E.'s broad range of standard RM medium transformers can meet the large bulk of your needs, and also work efficiently with older, special transformers now on your system. General Electric Co., Schenectady, N. Y. 416-11

*Reg. Trade-mark of General Electric Company

*Progress Is Our Most Important Product*

GENERAL ELECTRIC




Subsidence danger dictated the use of reinforced encasement for this new P.T.&T. duct course below four old street surfaces and under Southern Pacific's tracks in San Francisco.

Distributed in the West by

**MAYDWELL & HARTZELL, INC.**

SAN FRANCISCO, LOS ANGELES, SAN DIEGO, PHOENIX, PORTLAND, SEATTLE, SPOKANE

# YOU CAN ACTUALLY SEE SOAPSTONE OCT-O-DUCT SIMPLIFY YOUR JOB

**1** **SIMPLE FABRICATION ON THE JOB**
Simple to cut with an ordinary saw. Simple to taper sawed ends with a regular shaping tool. **Simplicity** means **economy.**

**2** **SIMPLE PRE-CAST BASE BLOCKS**
The correct, inexpensive Soapstone base block is available for encased or unencased — reinforced or non-reinforced jobs.

**3** **SIMPLE CIRCULAR COUPLINGS**
Simply tap them into place by hand. Polyethelene couplings for direct burial — spiral wound jute for encased installation — couplings assure you everlasting, secure joint protection.

**4** **SIMPLE 4-FOOT LENGTHS**
Easy-to-handle Soapstone OCT-O-DUCT is indispensable in close quarters... invaluable on any job. It stacks — requires no interlayer spacers.

New, tapered-end OCT-O-DUCT is easier, faster and cheaper to install than ever before. Its many time- and work-saving features and full information on sizes, bends and accessories are contained in our Catalog and our Installation Manual. For your FREE copies, drop us a note on your letterhead.

## SOAPSTONE DUCT COMPANY

3985 Beach Street

Oakland 8, California

**Human history is in essence a history of ideas***

*H. G. Wells 1895

## Thomas Alva Edison

Harnessing electrical energy was his fixed idea At 27 he had invented the world's first incandescent lamp. Edison, a practical genius, inspired his team with enthusiasm. In the ensuing 57 years of his life he led them to find more ways to make electricity produce sound, light, motive power and heat —with more ideas than any other man of his time.

The Kerite Company was established when Edison was but eight years old. By the time his inventions were ready to add to America's prosperity, Kerite craftsmen had acquired more than a generation of cable-making "know-how." The newly formed utility and railroad companies of the 1870's relied then, as do their successors today, on the unfailing service and long life of Kerite cable.

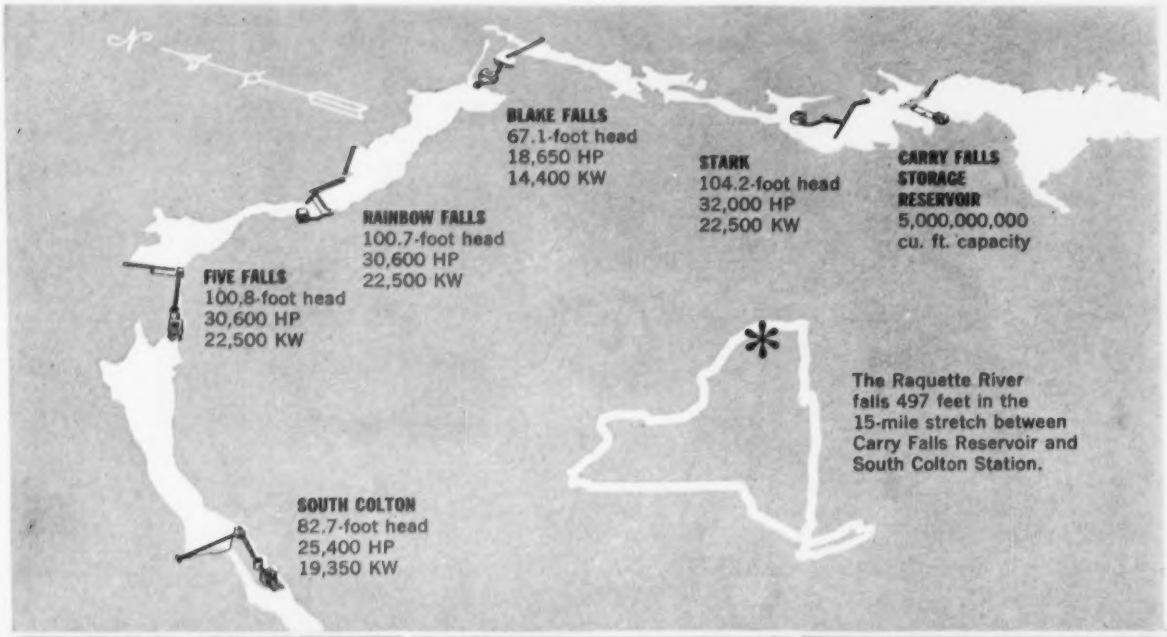
As power loads increase year by year, the inherited integrity and skill of today's Kerite craftsmen insure that the demands of far-sighted utility, industrial and railroad engineers will be amply fulfilled in the years ahead.

*The value and service life of a product can be no greater than the integrity and craftsmanship of its maker.*

# KERITE CABLE

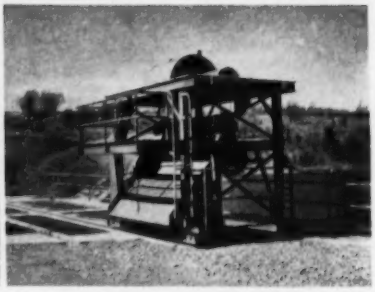
Founded 1854

THE KERITE COMPANY—30 Church St., New York 7, N. Y.
Offices also at 122 S. Michigan Ave., Chicago; 582 Market St., San Francisco;
3901 San Fernando Rd., Glendale 4, Calif.; 31 St. James Ave., Boston;
4101 San Jacinto, Houston 4, Texas; 1010 Euclid Avenue, Cleveland 17, Ohio;
29 West Lancaster Avenue, Ardmore, Pa.



South Colton powerhouse is typical of all 5 unattended stations. Supervisory control of automatic operation will be from Colton, 7 miles downstream.

Two SMS sliding gates with 50,000-lb. twin-drum cable hoists at Carry Falls Dam are designed for free discharge under a 58-foot head. This site can be converted to a hydro plant later if desired.



SMS self-dumping trash rakes operate directly on rack bars, ride down over obstructions and work them loose with a freedom of movement that assures fast, easy cleaning.

## 5 New Stations On Raquette River Equipped with SMS TURBINES AND ACCESSORIES

To further harness the Raquette River in northern New York, the Niagara Mohawk Power Corp. is now completing a series of five new power plants and a large storage reservoir. Each of these automatic, peak-load stations is equipped with an SMS-Francis turbine. SMS intake gates and twin-drum cable hoists, as well as trash rakes, are also used.

Working in close conjunction with Niagara Mohawk's engineers, SMS used two runner designs in the same basic wheel case for all five units. One runner design was used for the lower head turbines at South Colton and Blake, while another was used for the higher head turbines at Five Falls, Rainbow and Stark. This meant initial economy, and will provide operating and maintenance savings.

Each of the three lower stations uses self-dumping trash rakes at the turbine inlets. This design makes operation quicker and easier, cleans a greater area faster. For full information on these new trash rakes, or on other SMS accessories and hydraulic turbines, write S. Morgan Smith Co., York, Penna.

More Power To . . .

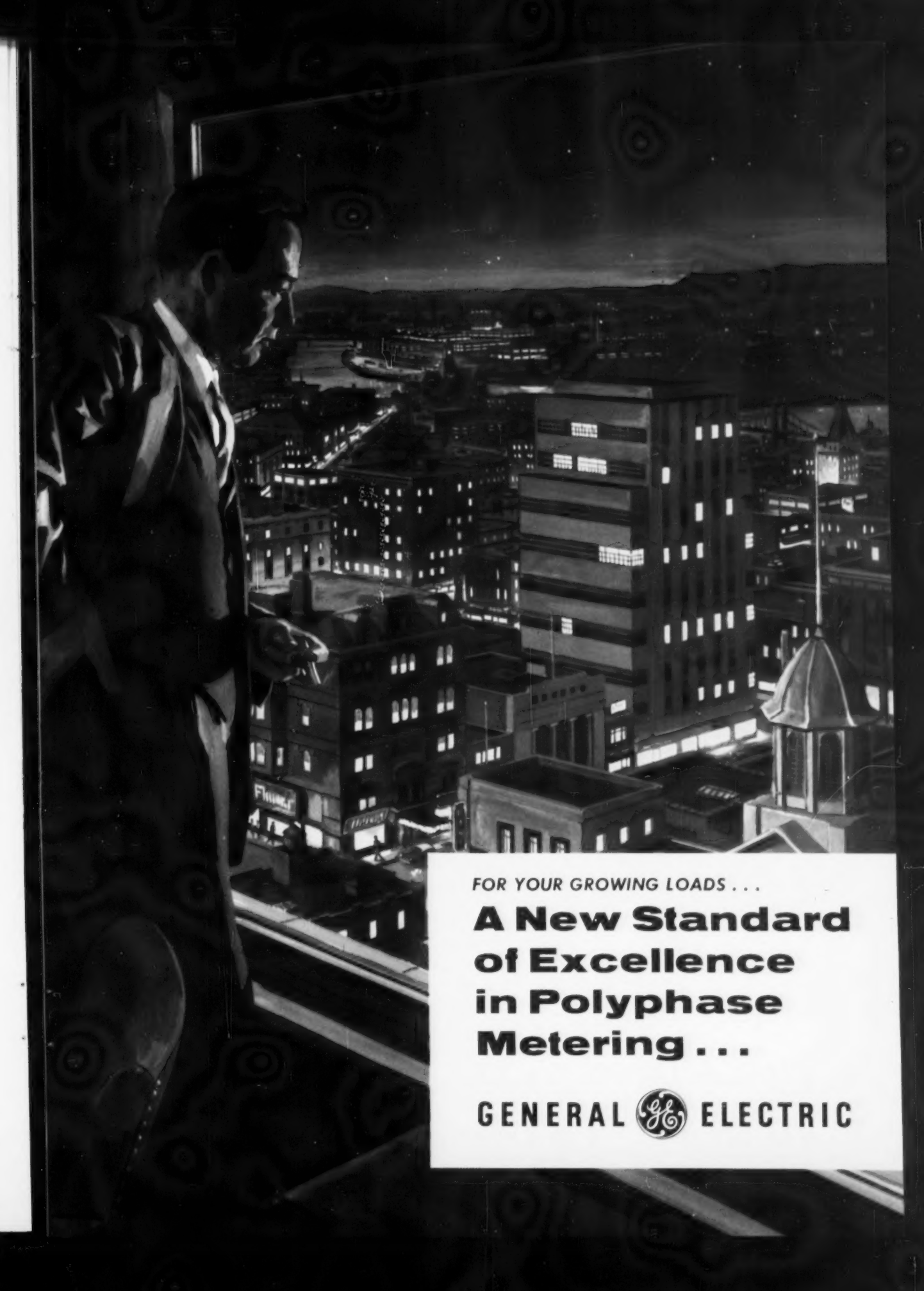
LIVE BETTER ELECTRICALLY

S. MORGAN SMITH

HYDRODYNAMICS

AFFILIATE: S. MORGAN SMITH, CANADA, LIMITED, TORONTO

Rotovalves • Ball Valves • R-S Butterfly Valves • Free-Discharge Valves • Liquid Heaters • Pumps • Hydraulic Turbines & Accessories


FOR YOUR GROWING LOADS . . .
A New Standard of Excellence in Polyphase Metering . . .
GENERAL ELECTRIC

NEW
KILOWATTHOURS
GENERAL ELECTRIC
TYPE V-62-S
30 AMPERES
240 VOLTS
60 CYCLES
3 WIRE
CAT NO 700X1G4
Kh 28.8
40 000 001

# V-60 POLYPHASE METERS

## by GENERAL ELECTRIC give you all the advantages of magnetic suspension plus extended range

Now for fast-growing polyphase loads everywhere, General Electric's New V-60 Polyphase Meter Family with magnetic suspension gives you greater sustained accuracy, eliminates bearing replacement, helps reduce installation costs and offers you extended current and potential range in just five different meters

**YOU GET FLEXIBILITY** in metering your various polyphase loads with just five different meters. The new General Electric V-60 family of polyphase meters includes the V-62 network meter, V-63 (3-wire, 3-phase), V-65 (4-wire, Y, 3-phase), V-66 (4-wire, △, 3-phase), and V-68 (totalizing). The extended range—666 2/3% of nameplate rating—means that any of the V-60 family of meters will stay on the job as your polyphase loads climb, whether the loads are residential, commercial, industrial, or special loads such as air conditioning.

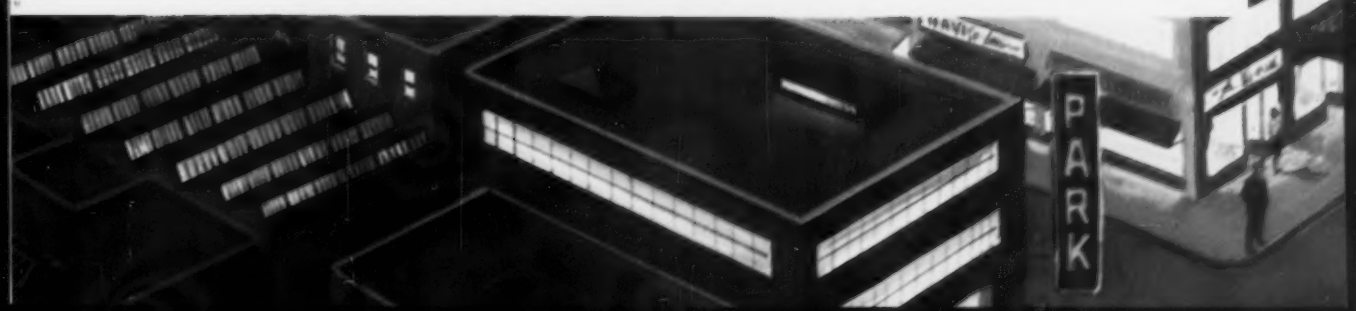
**YOU GET GREATER SUSTAINED ACCURACY** in the new V-60 meters because *magnetic suspension* avoids losses in registration caused by bearing wear. In the V-60 meters, you get the advantages of sustained accuracy which were time-proved in the more than 8 million I-50 series of single-phase meters in service today.

**YOU DON'T HAVE TO REPLACE BEARINGS** in the V-60 meters because with the *magnetic suspension* system there are no bearings! General Electric *magnetic suspension* cannot wear out . . . even after the equivalent of 300 years on accelerated life tests. With ever increasing polyphase loads, bearings in conventional meters become worn in a few years. With the new V-60 meters, you can lower metering costs by eliminating bearing replacement, due to bearing wobble and inaccurate performance.

**YOU CAN SAVE TIME AND MONEY** in installing and leveling meters because with the new V-60 family, meter tilt is a negligible factor. Any ordinary meter operating at even a slight tilt will give inaccurate readings and will result in substantial revenue losses. Lab tests prove that G-E meters with *magnetic suspension* practically eliminate revenue losses due to tilt.

*For more information on the new V-60 family of polyphase meters, or on any of the complete G-E line of meter products, contact your nearest G-E representative or Apparatus Sales Office, or write General Electric Company, Section 623-1, Schenectady 5, N. Y.*

GENERAL ELECTRIC



*NOW FROM GENERAL ELECTRIC...*

# Get Accurate Metering of Heavy Residential Loads with the New V-62 Meter

New General Electric Polyphase Network Meter, first of the new G-E V-60 family of polyphase meters, gives you all the really great advantages of the time-proved I-50 series of single-phase meters.

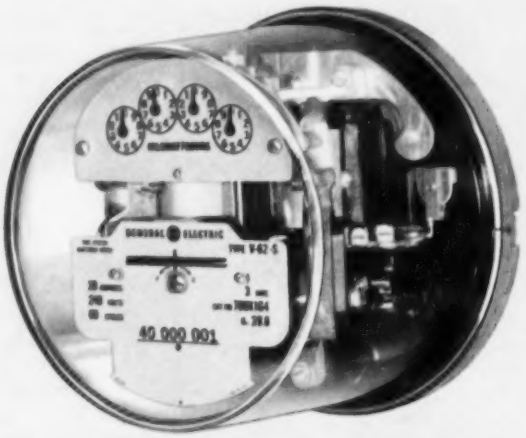
**FOR GROWING POLYPHASE LOADS** of both today and tomorrow, the all-new V-62 meter with *magnetic suspension* is available in both Class 100 and 200 ratings in either socket or bottom-connected types. In addition, this new network meter can be used in your 3-wire, 3-phase applications.

**MAGNETIC SUSPENSION** in the V-62 gives you the real advantages of greater sustained accuracy and no bearing replacement. You can lower your installation costs by spending less time and money on troublesome leveling of meters, since meters with *magnetic suspension* are less affected by tilt.

**EXTENDED RANGE** of the V-62 allows loads up to 666 2/3% of rated current to be metered without the need for current transformers. This means that meter replacement is unnecessary as polyphase network loads grow — whether the loads are residential or commercial.

**MAXIMUM SURGE PROTECTION** comes from coordination of surge-relief gaps and butyl-molded coil insulation. The revolutionary new gap system in the V-62 provides outstanding surge-current relief and helps avoid lightning damage and costly meter burn-outs.

**ADDITIONAL FEATURES** of the new V-62 network meter are ease of assembly and disassembly, excellent calibration stability, high corrosion resistance, interchangeability of registers with present meters, outstanding single-stator performance, and improved nameplate visibility.




**GET ALL THE DETAILS OF THE NEW V-62 METER BY CONTACTING YOUR G-E REPRESENTATIVE OR APPARATUS SALES OFFICE, OR BY WRITING SECTION 623-1, GENERAL ELECTRIC COMPANY, SCHENECTADY 5, N. Y.**

*Progress Is Our Most Important Product*

GENERAL ELECTRIC

**MEN RESPONSIBLE FOR**

**POWER DISTRIBUTION KNOW...**

# IF IT'S PARANITE IT'S RIGHT!®

***FROM AERIAL TO UNDERGROUND CABLE . . .***

Paranite has a cable specifically engineered to meet your most rigid requirements! Super-Pararite® butyl rubber insulations have been developed to withstand special conditions in *your* area. Copper or aluminum bare or weatherproof cables — ACSR or line wire (formerly products of Midland Wire Corporation) are available.

**PARANITE WIRE AND CABLE**

***DIVISION ESSEX WIRE CORPORATION***

**Factory: Anaheim, California**

**WAREHOUSES* AND SALES OFFICES**

*LOS ANGELES, 6415 East Fleet Street; *SAN FRANCISCO, 1077 Howard Street;
*PORTLAND, 525 North Tillamook Street

# "HERE'S SOMETHING NEW IN TRANSFORMER CONNECTORS"

KUHLMAN "Salesman of the Week"

If you can identify this Kuhlman representative, and are the first one to notify Dept. SA-1, Kuhlman Electric Co., Bay City, Mich., you will receive a valuable gift.



"It's a real pleasure to introduce to you the new Kuhlman low voltage connector for either aluminum or copper conductors.

"As you know, aluminum conductors cold flow more than copper when first connected to a transformer terminal. Then in normal operation they tend to loosen. A common solution is to increase the resiliency of the connector by adding a spring device. I consider the new Kuhlman connector, however, a much simpler, more efficient design. Here's how it works:

"First, when tightened, the eye bolt piece (shown as c above) stretches to accommodate the conductor and through inherent resilience holds the conductor firmly in place. Second, a greater contact surface (a) and (b) is provided for the conductor—particularly important for aluminum. Together, points (a), (b) and (c) maintain a firm contact under all operating conditions without over-stressing the conductor —whether copper or aluminum.

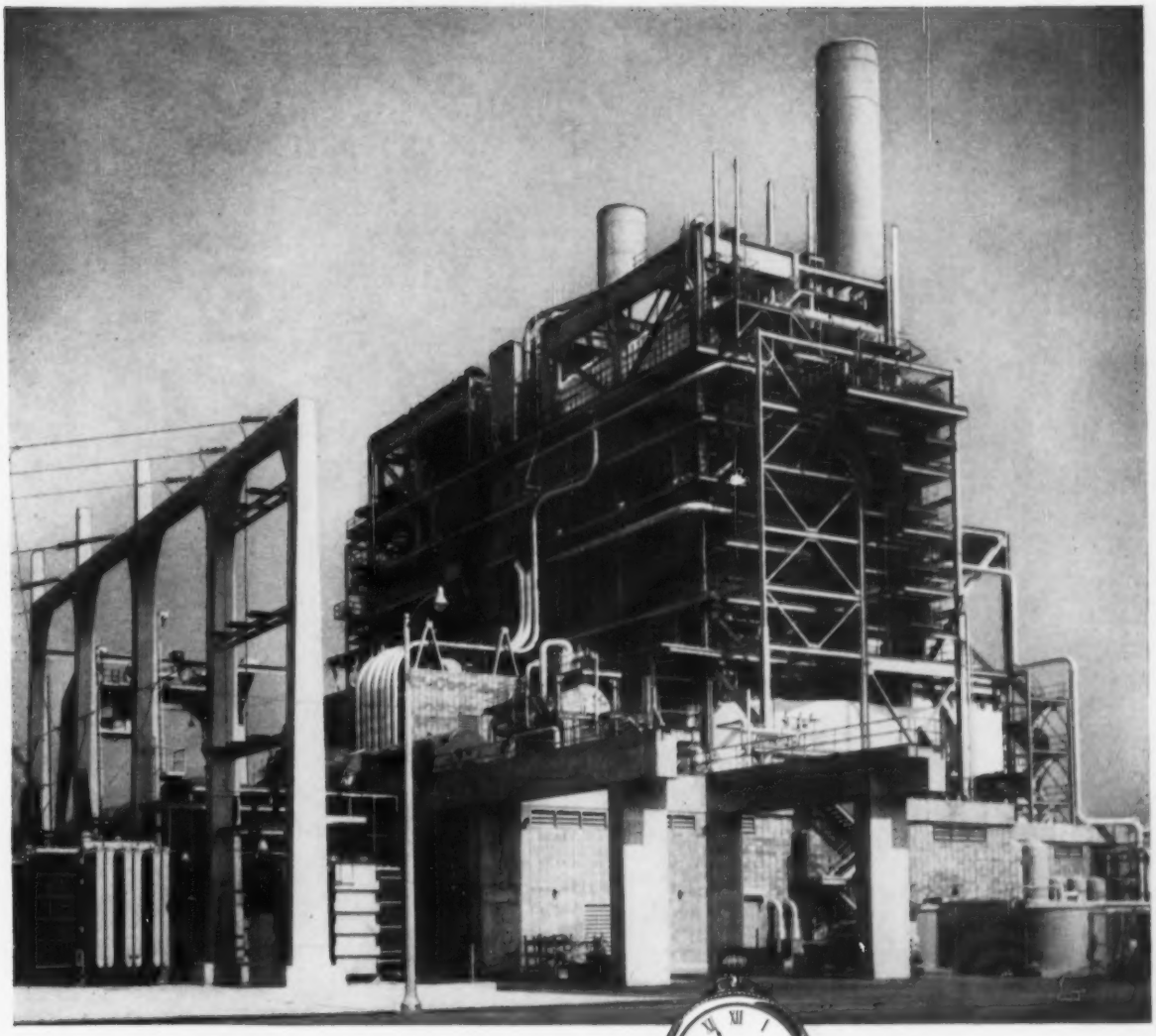
"The new Kuhlman connector is just one more example of how Kuhlman engineering aids the progress of your industry —in this case the recent trend to aluminum conductors. Write today for interesting two-volume story on transformer connectors appearing in present issues of our *Kuhlman Kurrent* house organ."

5713c

**KUHLMAN** ELECTRIC COMPANY

BAY CITY, MICHIGAN • CRYSTAL SPRINGS, MISSISSIPPI • SALINAS, CALIFORNIA

Distributed By MAYDWELL & HARTZELL, INC. • SEATTLE • SPOKANE • PORTLAND • SAN FRANCISCO • LOS ANGELES • SAN DIEGO • PHOENIX



## LIKE TO KNOW THE TIME?

Nineteen months after engineering started, the first of two 156,250 kw turbine generators in Southern California Edison Company's new Alamitos Steam Station (near Long Beach) was in operation. The second unit went into service 6½ months later.

This rapid schedule was made possible by close cooperation between the owner and Bechtel Corporation, the engineer-constructor.

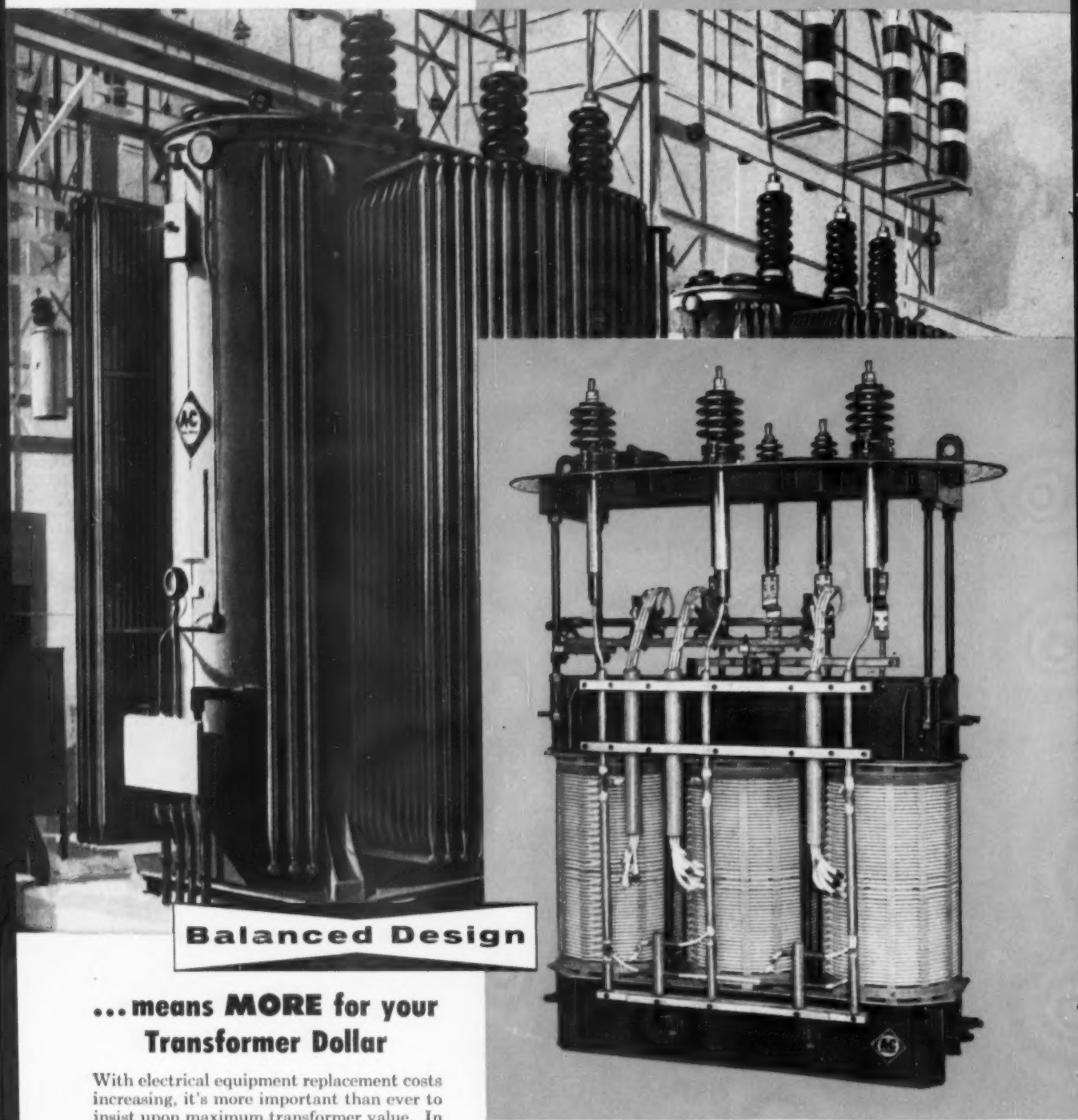
Other facts that make Alamitos newsworthy include: over-all economy of the project; design flexibility permitting future expansion; and the fact that its 312,500 kw output is a significant part of an expansion program that has increased Edison's steam generation capacity over three times in ten years.

BECHTEL

**BECHTEL CORPORATION** *Builders for Industry*
SAN FRANCISCO · Los Angeles · New York · Houston
CANADIAN BECHTEL LIMITED, Toronto · Vancouver

**ALLIS-CHALMERS**
**POWER TRANSFORMERS**

# Engineered



**Balanced Design**

## ...means **MORE** for your Transformer Dollar

With electrical equipment replacement costs increasing, it's more important than ever to insist upon maximum transformer value. In Balanced Design, features such as corona-free insulation, low gradients, and uniform cooling complement each other to provide outstanding dependability and long transformer life. Get all the facts. Call your nearby Allis-Chalmers office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

# ALLIS-

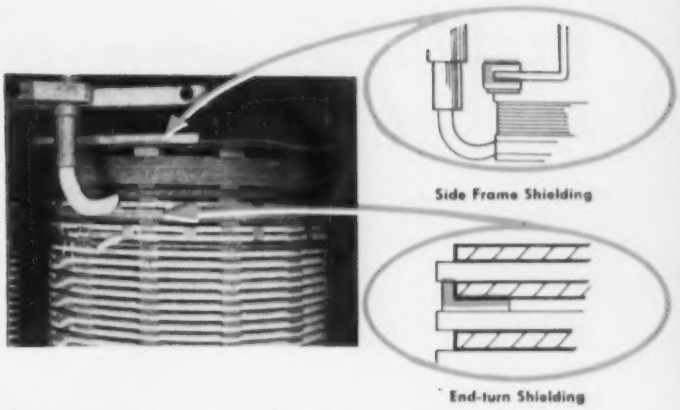
# to stay young

## Here's Why

**1**

### Corona-Free Design
gives insulation long life

Creeping paralysis caused by corona can't take the life of this transformer. Advanced insulation practices, dimensional properties, proper coordination between solid and liquid insulation materials prevent concentration of dielectric fields and keep corona from forming.



Side Frame Shielding

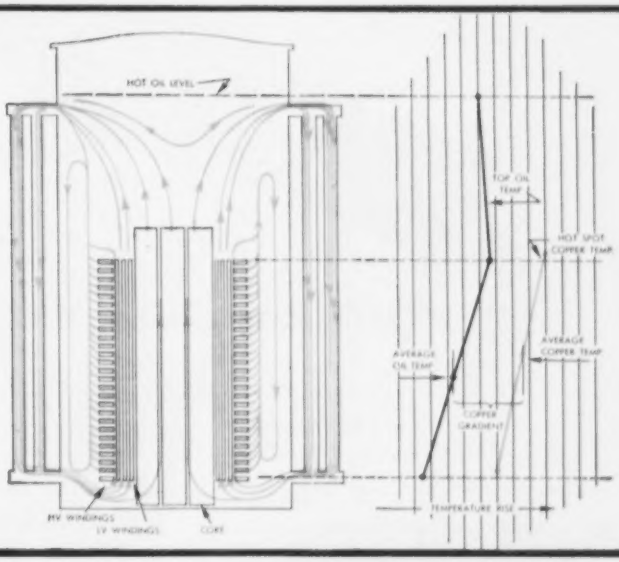
End-turn Shielding

Shown are just two of many shielded areas that protect windings from the overstresses of lightning and switching surges.

**2**

### Low Gradients
thorough cooling lengthens service

Temperature gradients are lower—hot spots are minimized in Allis-Chalmers transformers. Assembly is built for rapid cooling. Coils permit cooling oil to flow through and around all layers. Special core spacers on larger units allow oil to flow through core structure. Insulation coordination and uniform cooling increase insulation life and multiply the value received for each transformer dollar spent.




**3**

### New Radiator Design
cuts maintenance

Fewer parts—simplified shape facilitates inspection . . . there are no nooks and corners where dirt and corrosion get in their destructive licks. Painting costs are reduced. More uniform cooling (with less floor space requirements) extends transformer life.

# CHALMERS

A-C ALLIS-CHALMERS

A-5398

# New pressure-splice method insulates even this complex splice!

## "SCOTCHCAST" pressure method has widest application range of any insulating system!

**THIS "UNIPAK"** container holds the laboratory-correct mixture of "SCOTCHCAST" Resin No. 4 to make a fast, factory-quality splice in the field. This new Pressure-Splice method affords the utmost in excellent physical, electrical and moisture protection—consistently, splice after splice—*with any combination of cables and any combination of insulations.*

**THIS** new 3M Pressure Gun makes the "SCOTCHCAST" method practical, simple, and positive for any type of field splice where the size, shape, position, or inaccessibility of the splice make other splice insulating methods difficult. This gun was specially designed for the new Pressure-Splice method; makes insulating splices a neat, clean, quick, and *permanent* job.

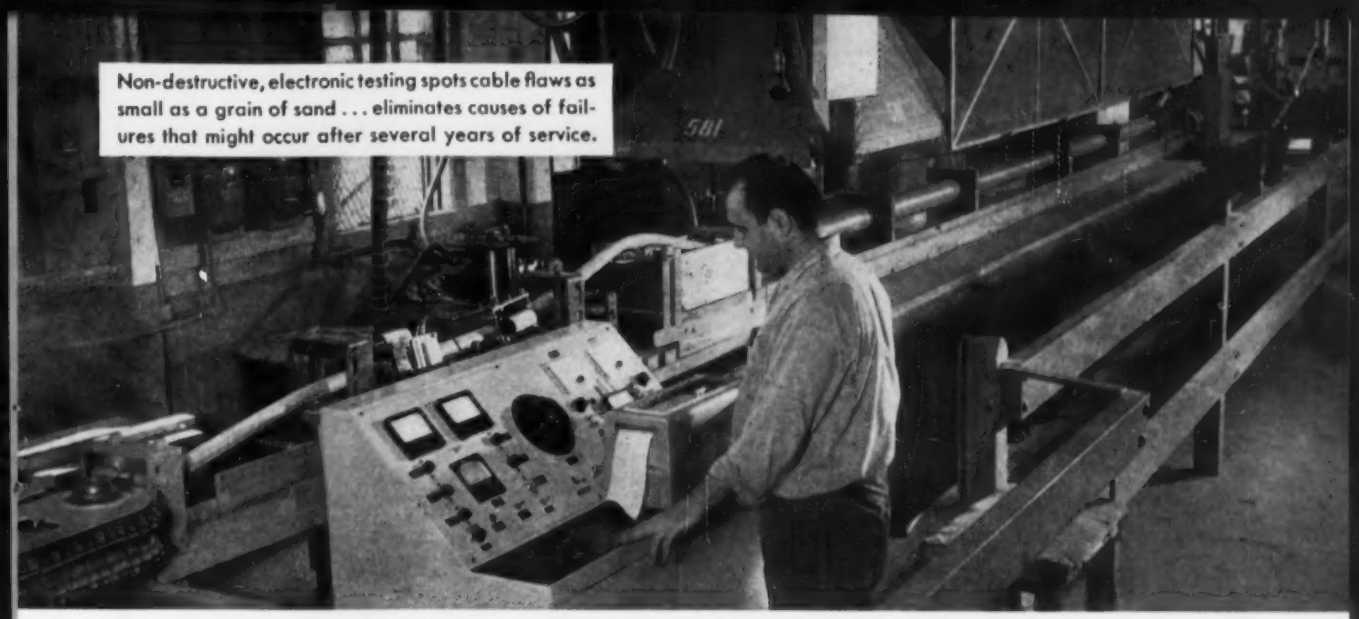
**SEND FOR** *complete information on the new* "SCOTCHCAST" *Pressure-Splice method for field use. Just write on your letterhead to: 3M Co., St. Paul 6, Minn., Dept. BU-67.*

REG. U. S. PAT. OFF.
**SCOTCH BRAND Electrical Products**

*by the makers of*
REG. U. S. PAT. OFF.
**SCOTCH BRAND**
**No. 33 Electrical Tape**

The term "SCOTCH" and "SCOTCHCAST" are registered trademarks of Minnesota Mining and Manufacturing Co., St. Paul 6, Minn. Export Sales Office: 99 Park Ave., New York 16, N. Y. In Canada: P.O. Box 757, London, Ontario.

PRODUCT OF 3M COMPANY RESEARCH



Non-destructive, electronic testing spots cable flaws as small as a grain of sand . . . eliminates causes of failures that might occur after several years of service.

# now all Okonite rubber strip-insulated cables rated above 2kv undergo the most searching test in the industry

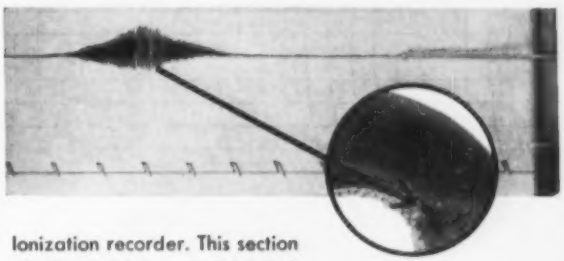
The Gooding Test Train, an Okonite development, can literally peer through every inch of solid dielectric cable to pinpoint flaws for removal or correction.

Two years' experience in regular production has proved that the Gooding Test Train detects flaws heretofore unrevealed even by the highest industry voltage tests or full-reel corona tests. Now that this valuable method of quality control has been thoroughly established, Okonite has extended its testing range to all strip-insulated cables rated above 2kv.

The entire cable passes through a series of three test units which provide unequalled assurance of successful service. The Gooding Test Train is used on strip-insulated cables in addition to Okonite's self-imposed, factory high-voltage acceptance tests which exceed industry specifications.

**UNIFORMITY TEST**—A uniformity gauge continuously checks insulation thickness to locate any thin spots.

**IONIZATION TEST**—The tiniest voids and imperfections are detected and located by measuring the corona level of the cable inch-by-inch. To pass, a cable must not show any trace of corona at a test voltage that is 1½ times the rated voltage of the cable. Defects that might escape any other known factory acceptance tests show up clearly on the associated ionization recorder. Defects of this kind can cause premature failure after only a few months' or years' service.



Ionization recorder. This section of the continuous inch-by-inch ionization test shows the recording of a defect in the insulation.

**X-RAY TEST**—A 250,000-volt X-ray machine can be used to study the nature and extent of any flaws located by the first two units.

For additional information about this revolutionary testing method, write for Bulletin WE-1100. The Okonite Company, Passaic, N. J.

4702

*where there's electrical power . . . there's* **OKONITE CABLE**

in the long run... it's O.Z.

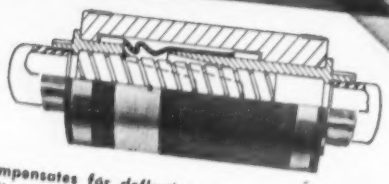
Type AX

Provides 4" expansion, contraction movement. Malleable iron head, body Hot Dip Galvanized. Weathertight head sealed by factory-installed high grade graphite packing. Insulating conduit end bushing eliminates cable abrasion. 10 sizes for conduit ½" to 4" diameters.

Type EX

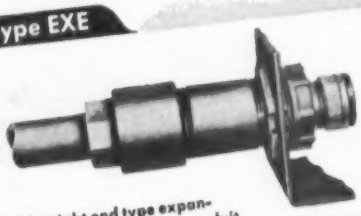
Permits 8" conduit movement. Optional length sleeves, additional cost. Weathertight head sealed by factory-installed high grade graphite packing. Insulating bushings prevent cable abrasion. Hot Dip Galvanized finish. 13 sizes for ½" to 6" conduit diameters.

Type EXDS



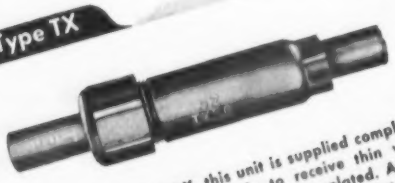
Compensates for deflection, expansion, contraction. ¾" movement all directions from normal; 30° angular movement. Also used as vibration damper between conduit sections. 10 sizes.

Type EXE



Weathertight end type expansion fitting. Designed for conduit terminating in junction box, where expansion, contraction take place. Supplied complete: locknuts, bushings. Standard finish, Hot Dip Galvanized. 13 sizes.

Type TX



Similar to the Type AX, this unit is supplied complete with extension nipples, ready to receive thin wall couplings. Standard finish is cadmium plated. Available in 6 sizes for conduit ranging from ½" to 2".

for the **longer line** of

# EXPANSION FITTINGS

**In the long run, no line of conduit is more dependable than its components. When it comes to dependability in expansion fittings, look to O. Z. as the line that measures up! Five basic types provide the dependable answer to your fitting problems in conduit expansion, contraction, and deflection. O. Z. is the dependable line because it's the line with the *right size*, the *right type*, for every requirement!**

**O.Z. ELECTRICAL MANUFACTURING CO., INC.**

262 BOND STREET • BROOKLYN 17, N. Y.

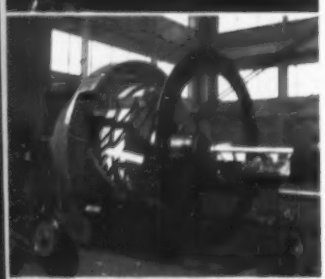
- CAST IRON BOXES
- CABLE TERMINATORS
- POWER CONNECTORS
- SOLDERLESS CONNECTORS
- GROUNDING DEVICES
- CONDUIT FITTINGS
- INTERLOCKED ARMOR CABLE FITTINGS

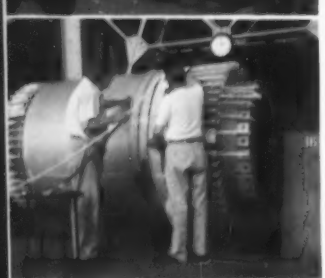
Sales Office and Warehouse: 406 So. Cicero Avenue, Chicago 44, Ill. • ESterbrook 9-0326
Office and Factory: 749 Bryant Street, San Francisco 7, Calif. • GArfield 1-7846

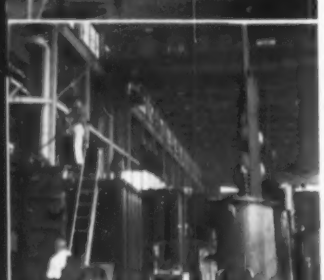
In observing the oscillogram pattern, the engineers are using an important tool . . . the surge generator . . . in the process of confirming the applications of Moloney's engineering know-how and experience. Successful test results are not things of chance. Many operations must be skillfully performed and specially designed fabricating and processing facilities must be used. Some of these are shown on the next pages and are visual evidence of why utilities think of Moloney and dependability as being synonomous.

# PATTERN FOR PERFORMANCE

MOLONEY ELECTRIC



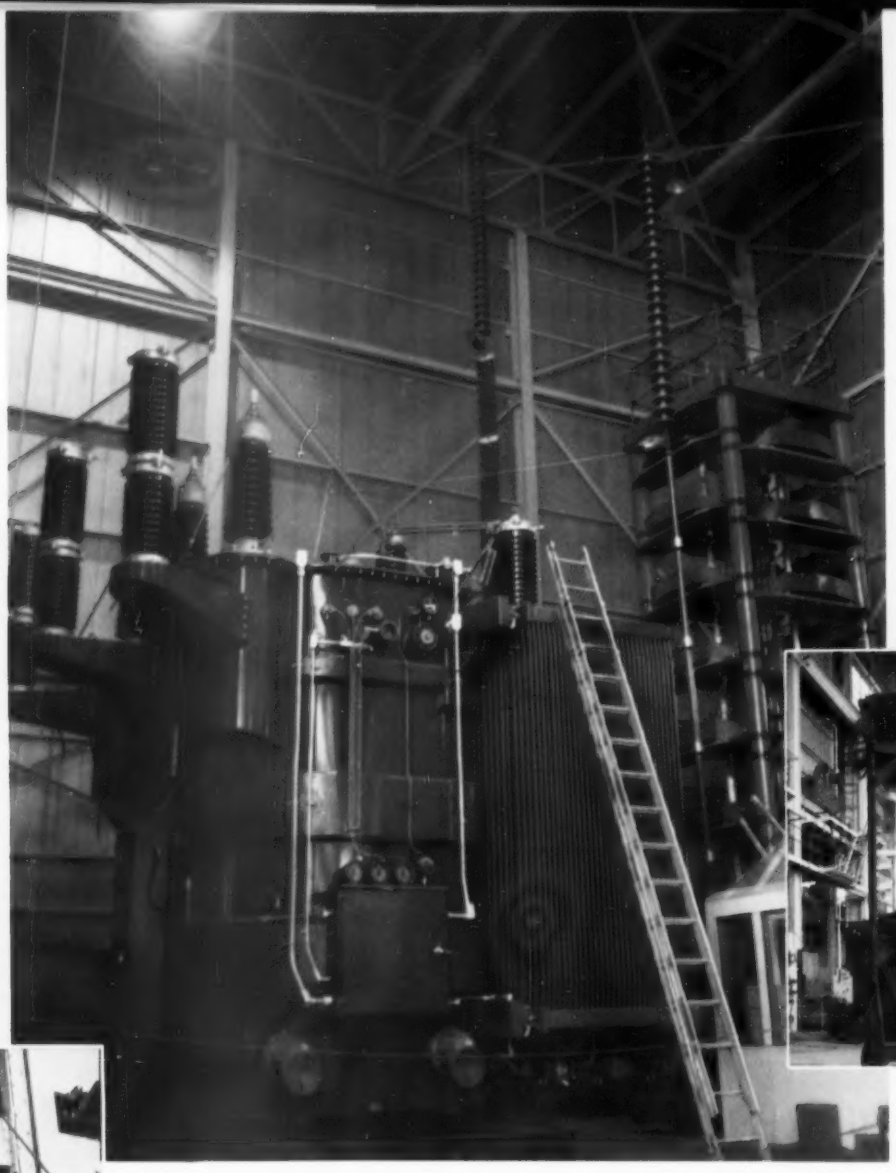


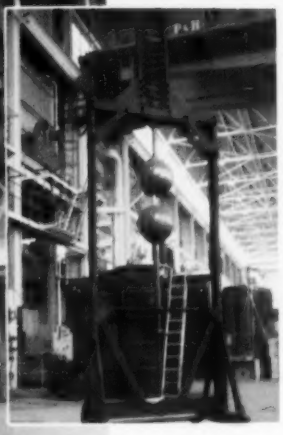


## KNOW-HOW, SKILL AND FACILITIES!

Utility needs have been anticipated for today's and tomorrow's increased transformer ratings. Machinery designed and developed by Moloney makes many transformer fabrication operations routine. Within this building are... facilities for winding the largest concentric disc and concentric layer type coils ...specialized core stacking equipment ... drying ovens ... and large areas for assembling core-and-coils, tanking, and installing various items which result in a completed transformer. The space to work is here ... over 80 feet wide, 530 feet long and seven stories high. Transformers are moved by two huge cranes capable of operating independently or in tandem. Step by step ... each stage of manufacture employs the latest and best facilities for the industry's most skillful craftsmen.

MOLONEY ELECTRIC





NEMA tests . . . your particular utility's test . . . and Moloney's own rigid quality and performance tests are made here. Adequate facilities to test transformers of any Kva rating are installed and in operation. When your transformer is built and tested by Moloney you have . . . dependability at its best.

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*Manufacturers of Transformers for Utilities, Industry, and Electronic Applications*

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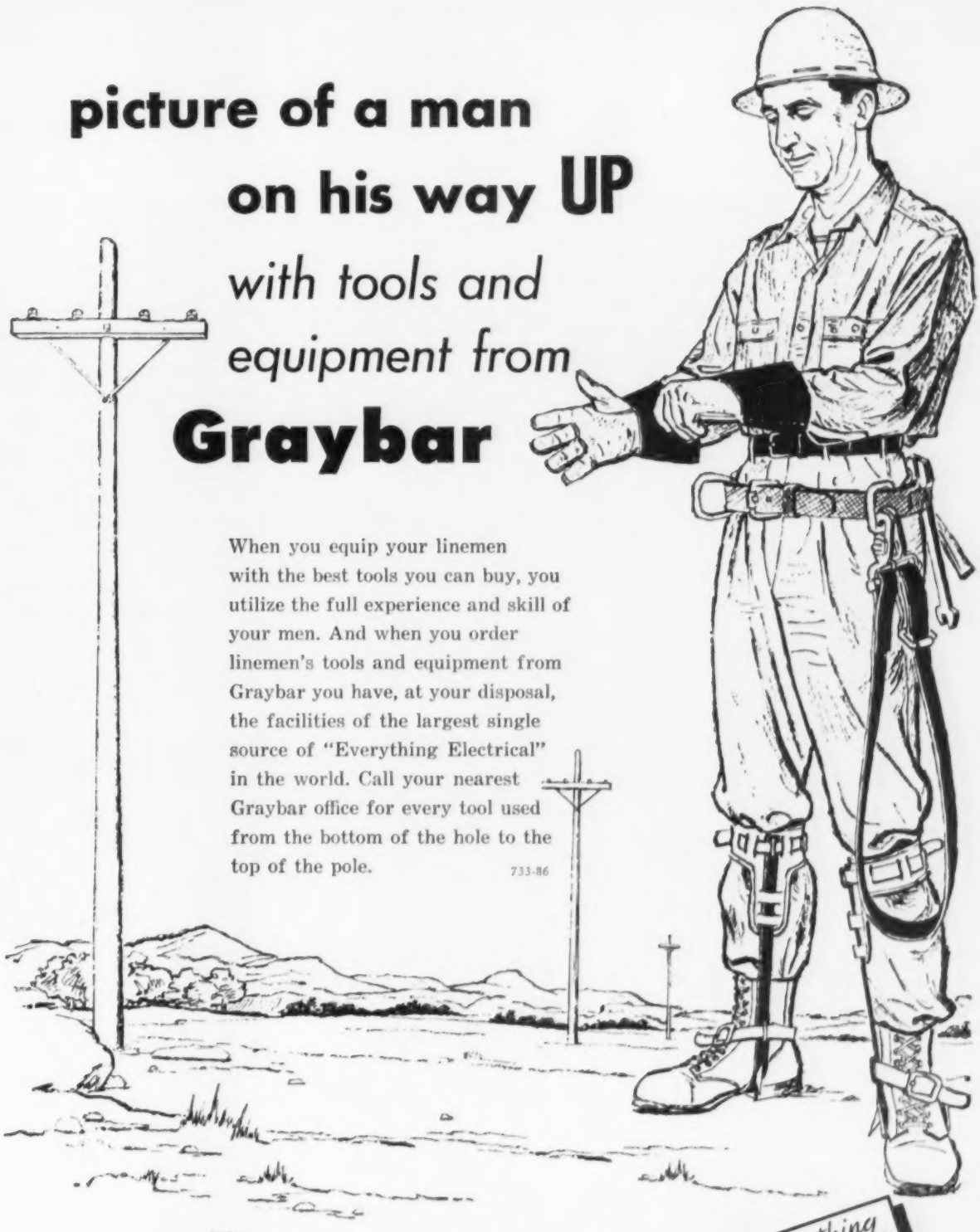
# picture of a man on his way UP

*with tools and equipment from*

# Graybar



When you equip your linemen with the best tools you can buy, you utilize the full experience and skill of your men. And when you order linemen's tools and equipment from Graybar you have, at your disposal, the facilities of the largest single source of "Everything Electrical" in the world. Call your nearest Graybar office for every tool used from the bottom of the hole to the top of the pole. 733-86

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GRAYBAR ELECTRIC COMPANY, INC.
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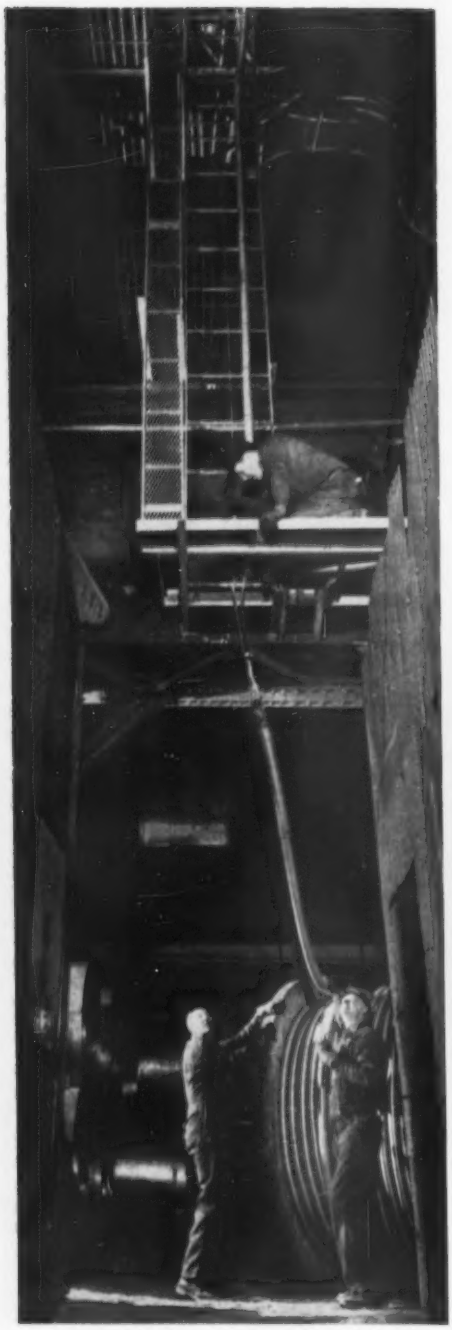
IN OVER 130 PRINCIPAL CITIES

# If you want to be sure *install Tiger Brand*



Cable is pulled through the racks. Pulleys ease it through at each turn.

SINCE we've been making electrical cable at American Steel & Wire since 1891, customers often ask us how they can best plan for *future* wiring needs. They've seen the shocking cost of plant modernization programs in buildings that were not designed with foresight.

Electrically speaking, you're going to need a *flexible* wiring system, one that can be enlarged or revamped with ease. To lots of designers today, that means a feeder system that is *not* permanently sealed in rigid conduit, frequently buried under tons of concrete and, in case of damage, frequently unrepairable. All of these problems are solved when you install flexible Armorlokt in an open-rack system.

Initial installation is not difficult. Extra feeders can be added easily at any time. Special feature: Splices can be made *anywhere* along the cable's length. The pictures on these pages show how adaptable and flexible such a wiring system can be.

Tiger Brand Armorlokt is made in a complete range of sizes and constructions. Ask your AS&W salesman.

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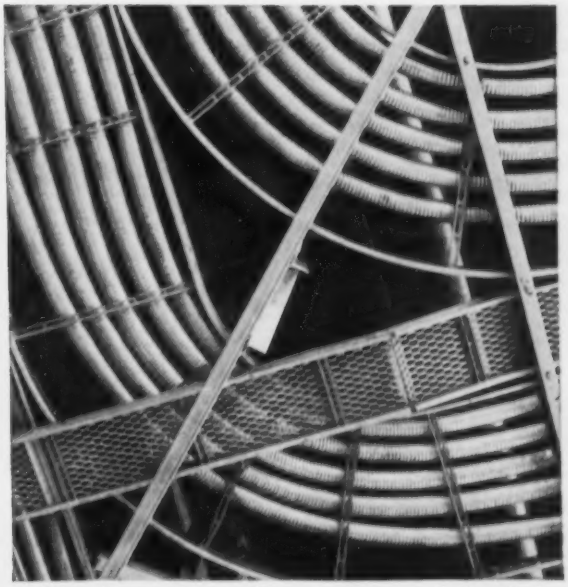
**GENERAL OFFICES: CLEVELAND, OHIO**
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

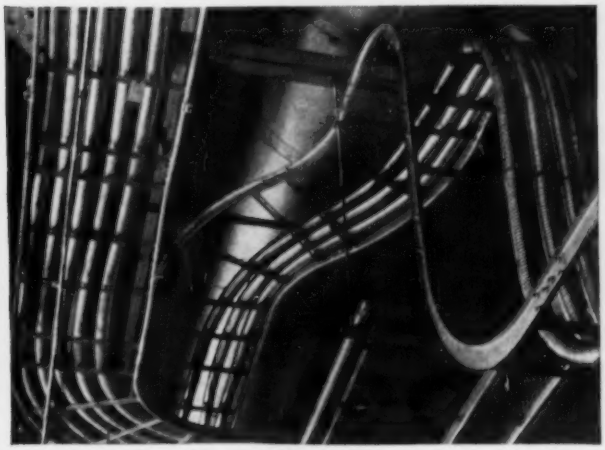
Winch on truck does the pulling. Crew members talk to each other with telephones.

# of adequate wiring in 1977, *Armorlokt now!*

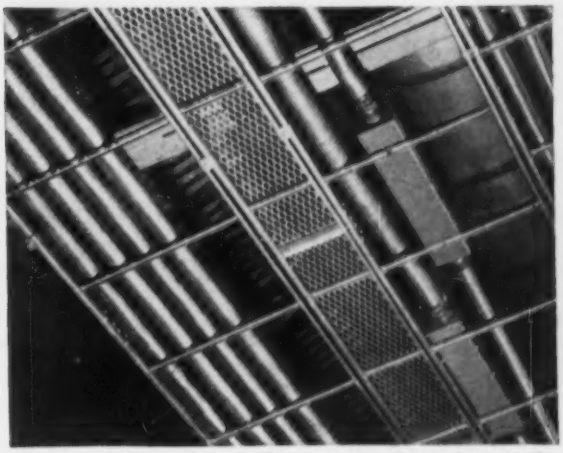
Armorlokt terminates easily. Flexibility of the cable eliminates fussy joint work.



Small radius or large radius curves are easily handled. Space is left for future cable.



Imagine how this would look using old-style conduit. Now it's neat and accessible.



Splices can be made anywhere, an important feature if cable is damaged in service.

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*A STANDARD TIGER BRAND CABLE FOR EVERY SPECIAL JOB*

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- MOLD CURED PORTABLE CORD
- SHOVEL & DREDGE CABLE
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- AERIAL, UNDERGROUND AND SUBMARINE CABLE

USS

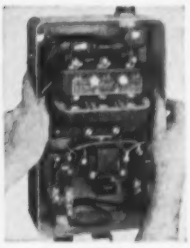
UNITED STATES STEEL

# CLARK Type "CY" Starters need less maintenance ...when they do, it takes less time!

All parts in Clark Type "CY" AC magnetic starters are designed for dependable, heavy-duty, long-life operation. The exclusive "CY" principle of arc quenching—using strong multi-turn magnetic blowouts and double-break contacts—substantially lengthens contact life by minimizing arcing effects. Hundreds of thousands of Type "CY" starters in actual service have proved that these features mean less frequent maintenance.

When service or alteration is required either because of wear or change of application, Clark Type "CY" design makes the work easier and much faster. All parts are readily accessible from the front—screw-driver and wrench are the only tools needed. Service kits are available for all replacements. Times shown below include all operations, starting with a wired unit in a cabinet. The starter illustrated is Size 2, but servicing other sizes is correspondingly simple.

### INSPECT CONTACTS AND SPRINGS



Simply open snap-action clips to release lower arc shield, exposing all contact surfaces to view. Replace arc shield after inspection. No tools required. Contact springs are in view at all times.

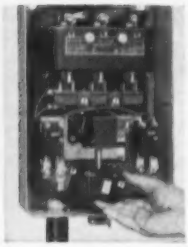
**TIME—10 SECONDS**

### REPLACE CONTACTS AND SPRINGS

Loosen two captive screws holding movable contact arm in place. Release lower arc shield by opening snap-action clips. Remove contact arm and lower arc shield together. Movable contacts are removed by a simple twist to depress springs. Remove springs. Stationary contacts are loosened with a wrench. Reverse operations for installing new springs and contacts.

**TIME—2½ MINUTES**

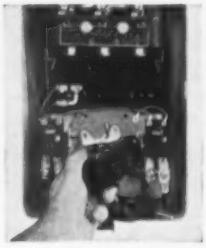
### REPLACE COIL



Remove snap-in pin to release armature. Remove coil connections. Remove coil clamps held by two captive screws. Coil drops free. Reverse operation for replacement.

**TIME—2 MINUTES**

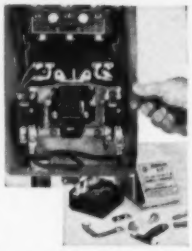
### REPLACE MAGNET ASSEMBLY



Remove contact arm. Remove armature and coil. Take out 4 holding screws and lift out magnet. Reverse operation for installing new magnet assembly.

**TIME—4½ MINUTES**

### ADD CONTROL CIRCUIT CONTACT



Remove main contact arm. Attach new control circuit block with stationary contacts to base plate (one screw). Mount movable control circuit contact and spring on main contact arm (one screw). Reassemble.

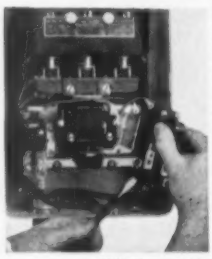
**TIME (Exclusive of Wiring)—1½ MINUTES**

### CHANGE OVERLOAD HEATER COILS

Remove overload relay cover plate held by one captive screw. Remove 2 connection screws and take out heater coil. Reverse operation for installing new coil.

**TIME—2½ MINUTES**
(Total for replacing both coils)

### REPLACE OVERLOAD RELAY



Disconnect wiring and take out 2 screws holding relay mounting bracket to base plate. Remove old relay from mounting bracket. Reverse operation for replacement.

**TIME—4 MINUTES**

### REMOVE STARTER FROM CABINET

Disconnect external wiring. Loosen or remove 3 screws holding starter to base plate (Note: on size 2 and smaller, all screw holes are slotted and screws need only be loosened). Lift starter from cabinet.

**TIME—1½ MINUTES**

Clark Type "CY" AC Magnetic Starters are now available in sizes 0 through 4.
For complete information contact your nearest Clark distributor or sales office, or write us direct.

*The* **CLARK** **CONTROLLER** *Company*

*Everything Under Control*

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Pennsylvania's Turnpike... Model for Modern Motoring

# WIRE BY PHELPS DODGE

When the Pennsylvania Turnpike opened in 1940, it was the first modern highway of its kind in the East. Since then, it has earned a reputation as a model super-highway whose design combines a free flow of traffic with a low accident rate.

One of the requirements for the Turnpike tunnels, interchanges, approaches and portal buildings was an electrical system of the highest quality. That's why Phelps Dodge building wire and rubber insulated, neoprene-jacketed cable was installed. For 17 years, this wire and cable has been giving the Turnpike dependable, trouble-free service.

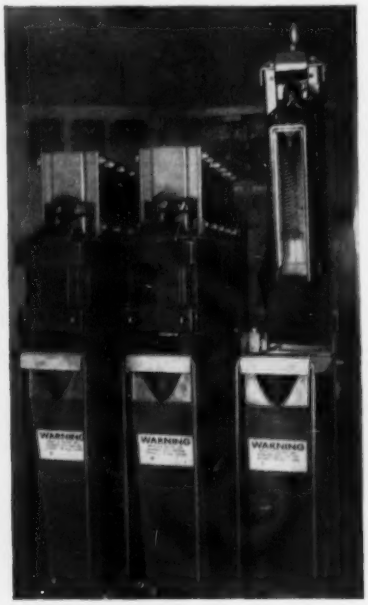
On every wiring job where top-quality performance, expert workmanship and experienced "know-how" are called for, *it pays to rely on Phelps Dodge and your Phelps Dodge distributor!*

**PHELPS DODGE COPPER PRODUCTS CORPORATION**

**SALES OFFICES:** Atlanta, Birmingham, Ala., Boston, Buffalo, Charlotte, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Fort Wayne, Greensboro, N. C., Houston, Jacksonville, Kansas City, Mo., Los Angeles, Memphis, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Ore., Richmond, Rochester, N. Y., San Francisco, St. Louis, Seattle, Washington, D. C.

## METAL-CLAD SWITCHGEAR

**PURIFIED PORCELAIN** in horizontal and vertical bus supports, primary disconnect bushings and caps and epoxy in bus joint covers provide excellent insulation, prevent fires in 15 kv I-T-E metal-clad switchgear.




**EPOXY AND SPECIAL CERAMICS** protect personnel and equipment by preventing fires in the circuit breaker section. Arc chute rear supports and blowout coils are epoxy. Jump gap cooling plates, arc chute liner plates, arc plates and spacers are special ceramics.

# Only the finest fire-protective insulating materials

Nonflammable porcelain and ceramics, flame-resistant epoxy, and other flame-retardant insulating materials throughout, are among the extra values you find in I-T-E Metal-Clad Switchgear. Purified porcelain, of which the primary disconnect bushings and caps are made, also supports both vertical and horizontal bus. It is nonflammable, has high dielectric strength, won't track or deteriorate, is inherently contamination free.

Epoxy, which can be molded into complicated shapes, forms arc chute rear supports, blowout coils, bus joint covers, potential and current transformers. It has high mechanical and dielectric strength, is nontracking and extremely flame resistant.

Special ceramics, highly resistant to direct arc exposure, are used in jump gap cooling plates, arc chute liner plates, arc plates and spacers. These have high dielectric strength, low moisture absorption, won't track, are excellent interrupting materials. They do not deteriorate when subjected to direct arc exposure. They absorb thermal shock and deionize gases without excessive heating.

Phenolic and polyester insulating sheets and moldings, specially treated to provide the highest possible degree of flame-retardant characteristics, are also used.

If you are planning new construction or modernization requiring electric power, consider the advantages of I-T-E equipment. Consult your local I-T-E sales office or write I-T-E Circuit Breaker Company, 19th & Hamilton Sts., Philadelphia 30, Pa.

**I-T-E CIRCUIT BREAKER COMPANY • Switchgear Division**

IN CANADA: EASTERN POWER DEVICES, LTD.

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*with*

## BLACKBURN *Grounding* DEVICES

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One plate tower ground clamp

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Copper Bonded Pigtail

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Type GG
Ground Rod Clamp
Socket set screw

Type GGH
Ground Rod Clamp
Square head bolt

Type B
Budget Line Ground Rod Clamp
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Type GP 100
Electrolytic Copper Pole Bottom Plates
7½", 10", 14" dia.

Blackburn grounding devices will save you thousands of dollars annually in preventing burnouts of expensive overhead equipment. This complete line simplifies your stocking problem—one source for all your needs. Like all BLACKBURN products they are constructed of high-strength corrosion resistant materials—designed for easy installation and engineered for long-lasting, trouble-free grounding. Always specify BLACKBURN.

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The year World War II ended, The Fisher-Pierce Company began work with utility engineers to develop photoelectric controls. Automatic, dependable switching of street lighting circuits when illumination was needed, regardless of time of day, season or weather, was the fundamental idea. The Series 61300 was the first of five different, major groups of F-P controls that have followed.

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**THE FISHER-PIERCE CO., INC.**

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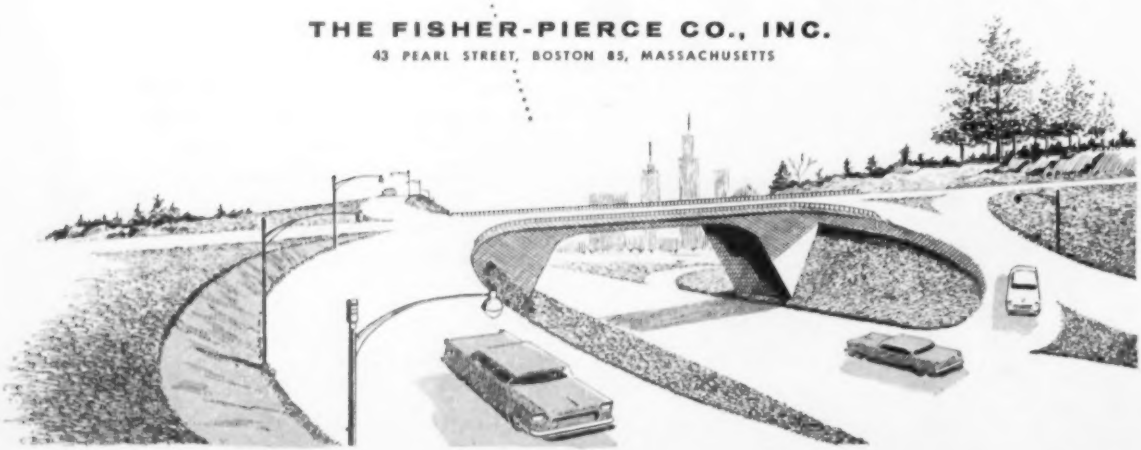

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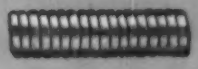
the new **FLEXIBLE LIQUID-TIGHT ELECTRICAL CONDUIT**

**REDUCES MAINTENANCE**
**PREVENTS SHUTDOWN**
**EASY TO WORK WITH**

FLEXIBLE STEEL CORE



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**FREE**
Write for sample and specifications brochure.

## IT'S LIQUID-TIGHT!

Flex-Seal has been designed specifically to meet the most adverse conditions—in chemical plants, machine shops, printing plants, food plants, breweries—any installation, indoors or outdoors, subject to moisture, coolants, salt air, corrosive fumes, chemicals, greases, abrasives, and other conditions that create hazardous wiring with ordinary conduit.

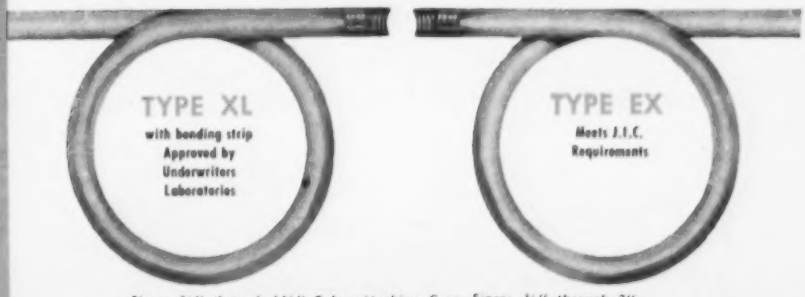
## IT'S SUPER FLEXIBLE!

Because it bends easily to small diameters and because it fits the tightest corners and most irregular shapes, Flex-Seal is ideal for wiring on machine tools, motors, pumps, air conditioning towers, outdoor amusements, conveyors . . . machinery of every type.

## IT'S ECONOMICAL!

Because the first cost is the last cost, Flex-Seal means genuine economy. It eliminates maintenance and prevents costly shutdown. Flex-Seal is easy to install too, cuts easily on the job without special tools. And, its machine grey finish stays cleaner-looking longer.

## 2 TYPES TO MEET EVERY REQUIREMENT




Sizes: ⅜" through 1¼" Color: Machine Grey Sizes: ⅜" through 2"
For installation with standard liquid-tight electrical fittings

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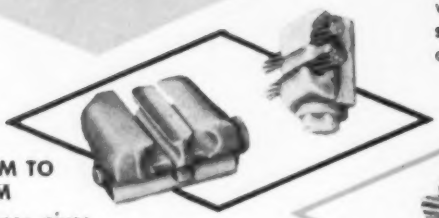
Bimetal inserts of pressure welded aluminum and copper sheet. Excellent conductor encirclement and separation.



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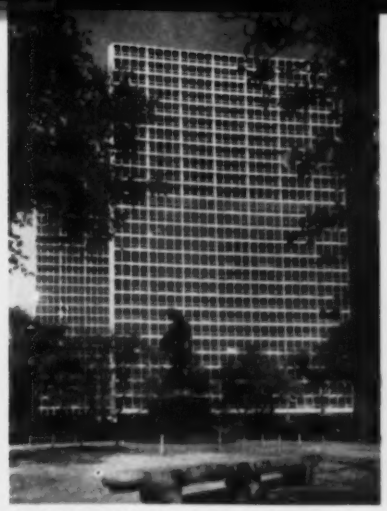

The first two units of Commonwealth Promenade are now occupied. SPANGLEAM EMT protects wiring throughout the 377 apartments. Power enters building at 480 V and is transformed to 240 V to prevent power drops.

Hyre Electric saved 50% installation time at Commonwealth Promenade Apartments by using SPANGLEAM EMT. SPANGLEAM is light weight, easy to work with, has high corrosion resistance.

# SPANGLEAM EMT does double duty at Chicago's Commonwealth Promenade Apartments

## 250,000 ft of SPANG thin-wall conduit protects all wiring, serves as a "spider-web" for decking

"We chose SPANGLEAM EMT for the Commonwealth Promenade Apartments because it can be installed in 50% of the time required for heavy conduit," says Mr. Leonard W. Martens, foreman, Hyre Electric Company, Chicago. "It couples quickly, is light weight and easy to handle.

"Commonwealth Promenade is all-electric. To handle all fixture and appliance requirements, 10,000 ft of ½" to 2" SPANGLEAM EMT was used on each floor — 6,000 ft in the decking and 4,000 ft for 'nippling up.' All conduit is imbedded in 2" concrete decks and walls."

***SPANGLEAM can save you time, too!***

The excellent SPANGLEAM exterior finish is highly corrosion-resistant and makes an excellent appearance in exposed locations. It does not chip, flake or peel, even under severe bending strains. The smooth, slick interior finish makes wire pulling easy. For your convenience and easy handling, SPANGLEAM is bundled in blue plastic tape.

Give SPANGLEAM EMT a try. You'll like the way it works for you. Ask for it at your local SPANG Distributor's.

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**Associate Architect: Mies Van Der Rohe & Ludwig**
**Construction Engineer: William Goodman**
**General Contractor: Herbert Construction Co.**
**Electrical Contractor: Hyre Electric Co.**
**Spang Distributor: Electric Supply Corporation**
**(All located in Chicago, Illinois)**

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Mr. E. H. Overcash of Mechanical Contractors and Engineers, Inc., Atlanta, Ga.

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"In all the years I've used Day-Brite fixtures, we've never had any trouble. Careful packaging is one important reason. These fixtures don't arrive at the job all bent up with the glass broken. No ballast failures, either.

"Day-Brite lighting brings repeat business because it satisfies our customers. Fixtures are easier to hang and that helps us save money, labor-wise. You can see why we installed Day-Brite lighting in our own new office building."

Minimum breakage, low-installation cost and satisfied clients, all lead to greater profits. Mr. Overcash and thousands of other contractors expect *and get* these higher profits with Day-Brite lighting. How about you?

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NATION'S LARGEST MANUFACTURER OF COMMERCIAL AND INDUSTRIAL LIGHTING FIXTURES

# "Magic Touch"

Lights burn and wheels turn when the magic of electricity surges through industry's life line of high voltage cable. Long, intensive testing has proved beyond question that Simplex ANHYDREX XX insulated cable possesses the stability and resistance that assure long, trouble-free service in all environments. Its amazing resistance to ozone and other oxidizing agents make Simplex ANHYDREX XX the logical choice for your high voltage applications. For complete technical data write for Booklet 1023.

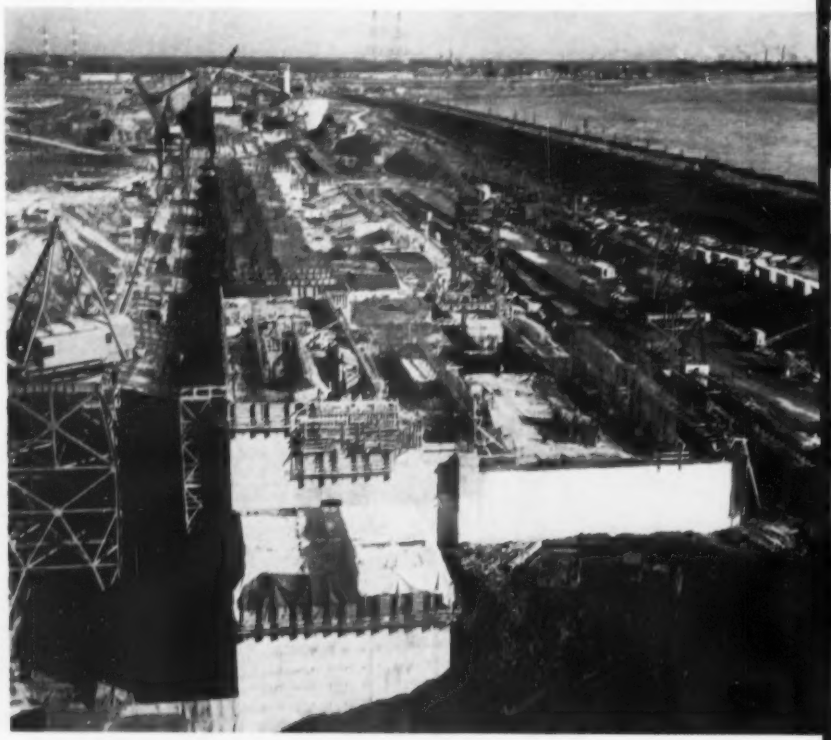
**SIMPLEX WIRE & CABLE CO.,**
79 Sidney Street, Cambridge 39, Mass.

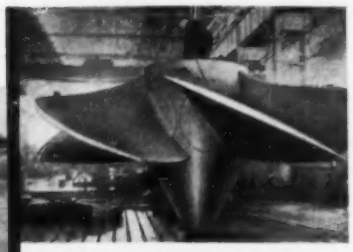
LIVE BETTER ELECTRICALLY

Simplex

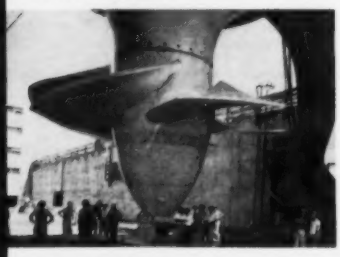
**ANHYDREX XX**

Overall view of the St. Lawrence Power Dam, Barnhart Island, N.Y. Here eight B-L-H fixed blade propeller turbines, each delivering 80,000 hp, will be installed. *Photograph courtesy Power Authority of the State of New York.*

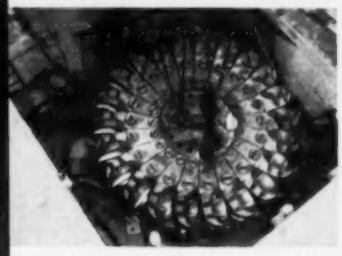




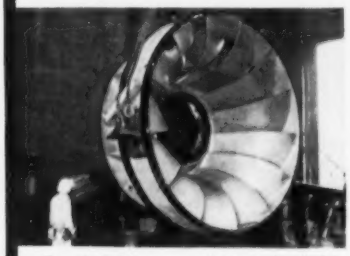
Balancing a fixed blade propeller runner for Wheeler Dam.



Adjustable blade propeller type runner being installed in TVA Fort Loudoun plant.



Impulse turbine runner being installed in the Kemano powerhouse of Aluminium Company of Canada Limited.



Francis turbine runner being unloaded in the Garrison Dam powerhouse.

One of 16 Kaplan turbine governors for The Dalles Dam.

# 4 reasons why B·L·H is your best source for turbines, pump-turbines and governors

1. Excellent hydraulic laboratories for testing scale models. A large accumulation of test data assures correct design of turbines to meet your specific requirements.
2. The Eddystone and Pelton Divisions of B-L-H have been designing and building turbines since 1841. There is no substitute for 116 years of experience.
3. B-L-H builds all four basic types—impulse, Kaplan, Francis and propeller. You can thus be certain that our recommendations are objective.
4. Governors, surge suppressors, valves, special pumps, and other accessory equipment are also manufactured by B-L-H. When we handle your complete turbine project, you eliminate the necessity of coordinating multiple sources of supply.

*For additional information, write B-L-H Corporation, Philadelphia 42, Pa., or Pelton Division (B-L-H), 2929 Nineteenth Street, San Francisco 10, Calif.*

**BALDWIN · LIMA · HAMILTON**

Eddystone Division

Philadelphia 42, Pa.

Hydraulic turbines • Weldments • Dump cars • Nonferrous castings

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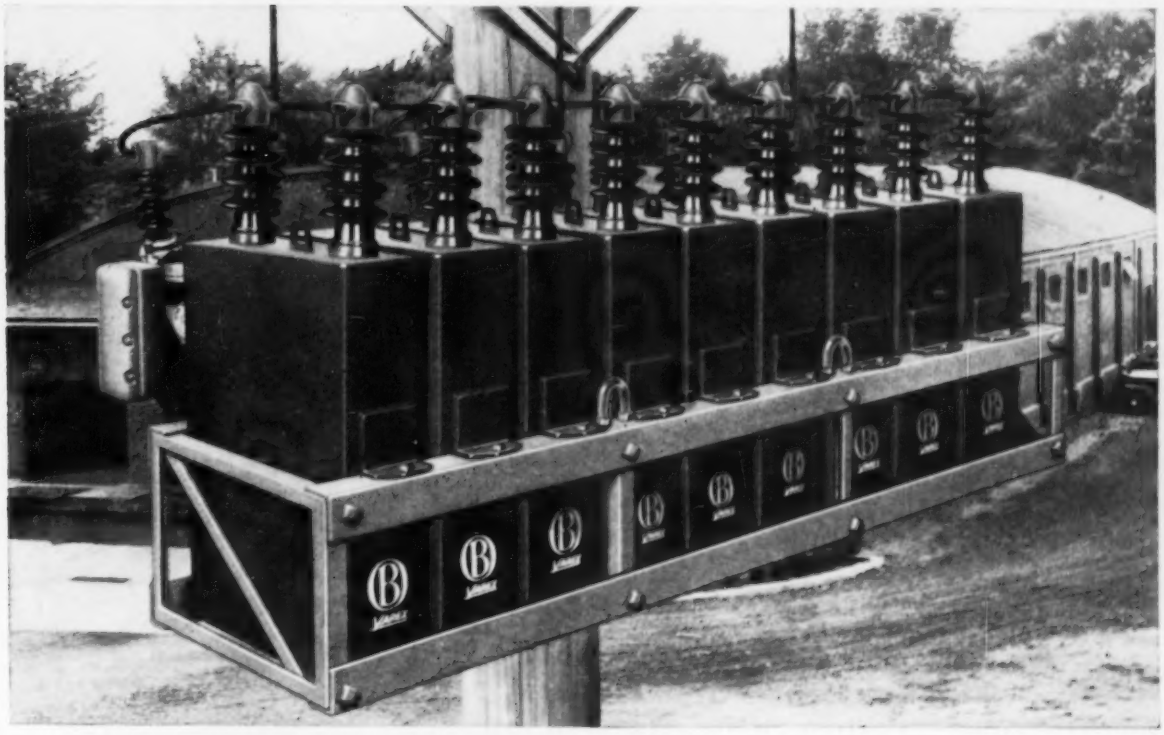
# O-B VAREX

## *a complete line of Shunt Capacitors to fill all your needs*

*Including Substation and Pole-Mounted Equipments made to NEMA standards*



. . . available in both 25 and 50 KVAR units.

. . . eight voltages for each KVAR rating — 2400, 2770, 4160, 4800, 6640, 7200, 7620, 7960.

. . . NEMA standard hangers for one, two, three or four units.

. . . factory-assembled, pole-mounted equipments with in-line or rectangular configuration, up to 12 units switched and unswitched.

. . . factory-assembled, substation equipments for building banks of any desired size.

. . . units, hangers and equipments meet all national standards for dimensions and performance.

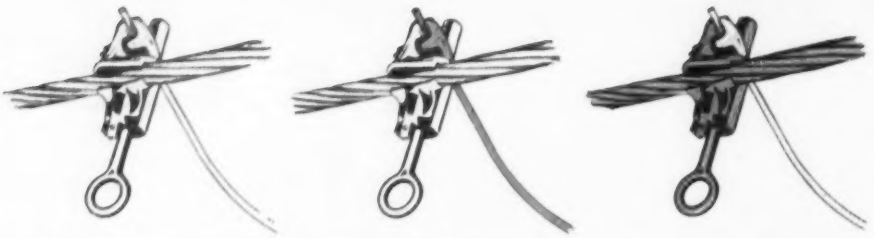
ASK YOUR O-B DISTRICT MANAGER FOR COMPLETE CATALOG INFORMATION ON VAREX

*—the cool capacitor*

Ohio Brass

OHIO BRASS COMPANY, MANSFIELD, OHIO

4751—H



ALUMINUM TO ALUMINUM ALUMINUM TO COPPER COPPER TO ALUMINUM

# You can tap all these with AGP* tap clamps

Chance AGP Clamps, approved by power company after power company on the basis of their own tests, can be used for all types of connections: copper to aluminum, aluminum to aluminum, and aluminum to copper.

Chance FORTIFIED cadmium coating, applied .001" thick to the aluminum body of the clamp, resists corrosion and electrolysis in all types of connections. This high density FORTIFIED cadmium coating gives extra long life protection to both the clamp and the conductor.

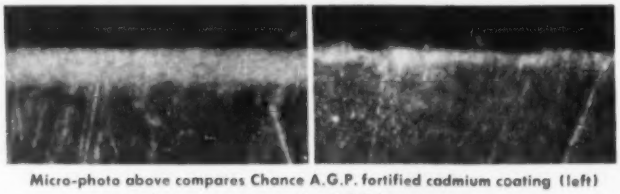
AGP tap clamps have the advantage of light weight which lengthens conductor life by minimizing the effects of vibration and makes them easy to handle on a clamp stick . . . plus easy identification with the RED EYE SCREW—plus their most important feature, their versatility. You can reduce your inventory and simplify your stocks by standardizing on AGP.

**CHANCE PERMA-GRIP TAP CLAMPS**

Here's a service-proved tap clamp for all general applications. Gripping jaws of this clamp make a three-point contact with conductor.

**CHANCE "P. C." (PROTECTED CONNECTION) CLAMPS**

Complete thread protection for easy installation and removal. No threads are ever exposed except in the extreme opened position. Wide jaws contact all strands.



Micro-photo above compares Chance A.G.P. fortified cadmium coating (left) to commercial plating, one reason for A.G.P.'s success.

*Aluminum General Purpose

ABC INDUSTRIES

CC56-8

**A·B·CHANCE CO·**

CENTRALIA, MISSOURI San Francisco, California

POWER PLANT SERVICES REPORT

# Kansas Gas & Electric meets high summer peaks with new 100,000-kw unit

The last decade has seen more than a tripling of Kansas Gas and Electric's load, spurred by a recent trend to much higher summer peaks. This trend began in 1954 when hot weather hit Southeastern Kansas. Due to air conditioning and other hot weather loads, K. G. & E.'s summer peak soared 26.8% higher than the previous year. Residential kilowatt-hour sales for the entire year were 29.8% greater than 1953, far more than the national average gain. This trend of rapidly increasing summer load continued at a similar rate through last year.

Kansas Gas and Electric engineers have consistently met this challenging situation by staying ahead of their requirements through forecasting and planning. Their latest step has been the addition of unit No. 3, a 100,000-kw General Electric steam turbine-generator, to K. G. & E's Murray Gill Station. By purchasing General Electric, Kansas Gas and Electric received the benefits of General Electric Power Plant Services . . . saving time, money, manpower.

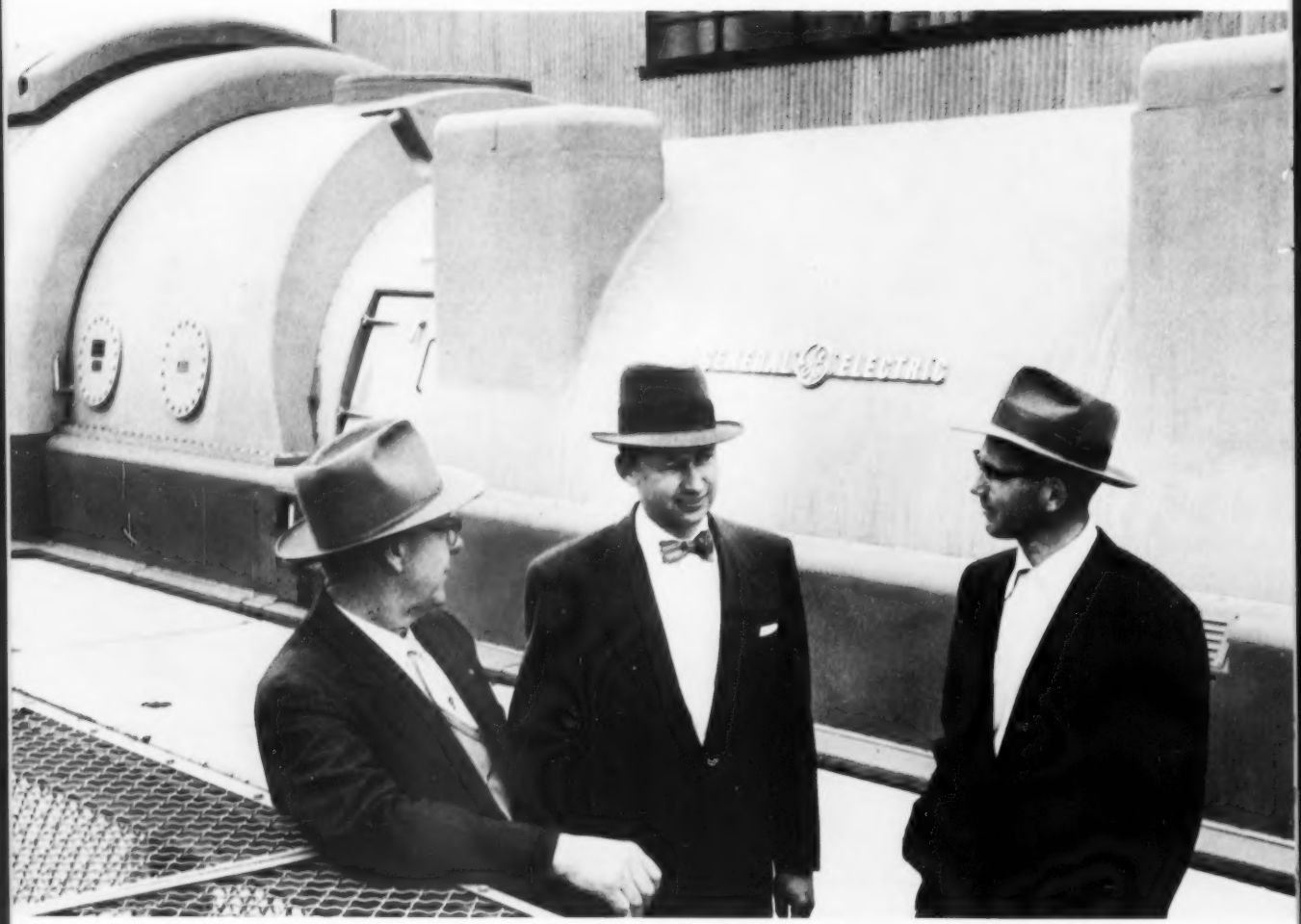
FOR MORE DATA TURN PAGE ▸

*MORE POWER TO AMERICA*

GENERAL ELECTRIC

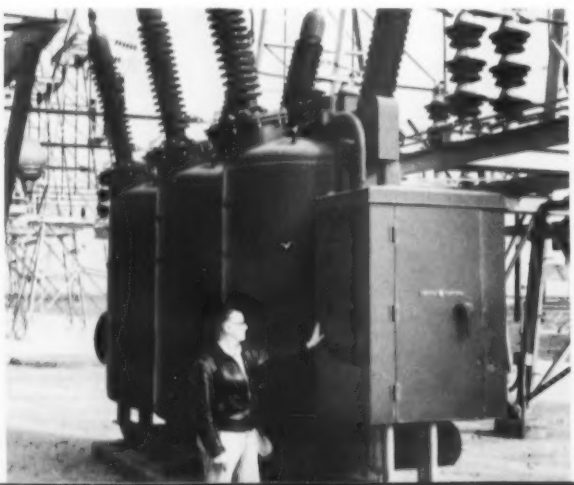
POWER PLANT SERVICES REPORT

# Teamwork of

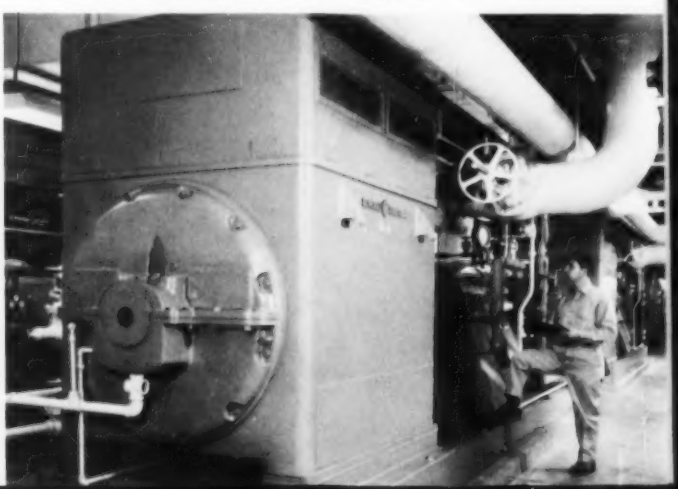


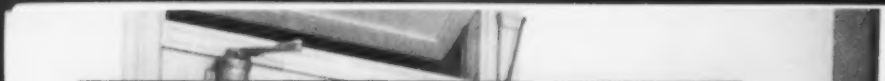
**GREATER CAPABILITY** to meet load growth is provided by Murray Gill Station unit No. 3, a General Electric tandem-compound, double-flow, reheat steam turbine-generator rated 100,000 kw. K. G. & E.'s A. W. Hall, Station Sup't.; H. W. McCall, Ebasco Services, Inc.; and G.E.'s R. C. Danford discuss operation of the new unit.

**HIGH SPEED OPERATION** of General Electric Type FK, 138-kv, 3500-mva oil circuit breakers provides system stability and full protection of electrical equipment.



**REDUCED SOUND LEVEL** is achieved through acoustic treatment of new G-E 1750-hp, 2300-volt boiler feed pump motors. Three such motors serve Murray Gill Plant.





# K. G. & E., Ebasco, and General Electric Boosts Murray Gill Plant Capacity 91%

## On-schedule, minimum cost installation achieved through integrated planning

The Murray Gill Station's capacity was increased to accommodate general load growth characterized by high summer loads. K. G. & E. planners decided to get the new unit on the line before the summer, making most advantageous use of it immediately. This necessitated careful planning and a large measure of utility-consultant-manufacturer co-ordination.

### PRE-INSTALLATION PLANNING

To a large extent, co-operative pre-installation planning made possible the smooth, relatively rapid, on-schedule installation of all electrical apparatus. It was an example of highly-efficient manufacturer-engineering co-ordination. General Electric Power Plant Service engineers assisted Ebasco and K. G. & E. engineers in applying equipments and fitting their functions to the station's needs. The result was an installation made economically, and with no serious complication. Kansas Gas and Electric planning includes addition of another 100,000-kw General Electric turbine in the near future. And, as in the case of Unit. No. 3, apparatus will be General Electric for standardization and simplification.

### MANY BENEFITS

This is typical of the many ways in which General Electric Power Plant Services can assist on your job. These services consist of application engineering, product development engineering, field service engineering, and power plant co-ordination which help to:

- SIMPLIFY ORDERING OF EQUIPMENT
- CONSERVE ENGINEERING TIME
- INTEGRATE EQUIPMENT DESIGN
- SPEED CONSTRUCTION
- ASSIST IN TRAINING OPERATORS

For full information on these Power Plant Services, contact your General Electric Apparatus Sales Office or write for 28-page bulletin GEA-6320 to General Electric Company, Section 302-17, Schenectady 5, N. Y.

FOR MORE DATA TURN PAGE ▸

*MORE POWER TO AMERICA*

GENERAL ELECTRIC

**TIME WAS SAVED** in installation by shipping this G-E Type FOA-T, 125,000-kva power transformer upright with unit coolers in place. K. G. & E.'s E. D. St. John, (left), Sup't. of Production, and S. J. Sickel (right), Vice-president—Operations, confer with General Electric Sales Engineer C. S. Clark.

**INTEGRATED ENGINEERING** was key to smooth, on-schedule installation of unit No. 3. In this planning conference are (left to right) S. J. Sickel, K. G. & E.; W. O. Harris, Ass't. Construction Mgr., Ebasco; E. D. St. John, K. G. & E.; and C. S. Clark, G.E.

**ENGINEERING TEAMWORK** saved time and money. At this meeting in Ebasco's New York office, (left to right) R. R. Bennett, Ebasco Mech. Engr.; D. T. Warner, G-E Sales Engr.; F. A. Ritchings, Ebasco Chief Mech. Design Engr.; R. H. Crone, Ebasco Elect. Engr.; and G. Spillane, G-E Application Engr. discuss Station's equipment needs.

# General Electric application engineers help assure on-time start-up

## Speed and reduced costs result from early, integrated planning

In the case of Kansas Gas and Electric's addition of unit No. 3 to the Murray Gill Station, co-operative engineering between manufacturer, consultant, and utility was highly successful. The early conferences between General Electric application engineers and Ebasco engineers helped Ebasco design and construct the most efficient and economical station for K. G. & E.'s needs.

When manufacturer and consulting engineer sit down at a planning conference, a great variety of highly specialized skills is brought to bear on selecting the proper electrical apparatus to provide maximum effectiveness and flexibility of your power station. For the manufacturer's contribution to this team, General Electric assigns a staff of engineers representing many years' experience in providing General Electric Power Plant Services.

As requirements in power station equipment grow to higher ratings, improved efficiencies, and even greater reliability, the advantage of selecting General Electric apparatus, combined with time-saving, money-saving General Electric engineering teamwork, offers electric utilities increasing reason to call in General Electric early when planning a new station.

LIVE BETTER ELECTRICALLY

*MORE POWER TO AMERICA*

GENERAL ELECTRIC

*Attention! All Users of Nickel Alloys...*

# New Driver-Harris Vacuum Melting Service Now in Operation

After many years of experience with vacuum melting programs, Driver-Harris now offers a complete vacuum melting service for almost all of the 132 special purpose alloys made by this company.

The specific benefits gained by vacuum melting in the production of nickel-chrome alloys are today clearly established. They are:

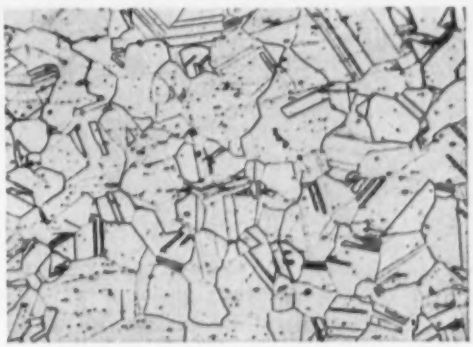
**1.** Much closer control of analysis—particularly in alloying with the highly reactive elements, Titanium, Aluminum, Columbium, Calcium, and Zirconium. The normally high affinity for nitrogen and oxygen these elements have is completely eliminated in vacuum melting, thereby opening new avenues in alloy production.

**2.** Great reduction in inclusions, especially oxides and nitrides, results in higher ductility and tensile properties. In fine wires, the improvement in properties is frequently so great that wire sizes may be reduced without sacrifice of strength. An example of the greatly improved microstructure is illustrated in the metallographs shown.

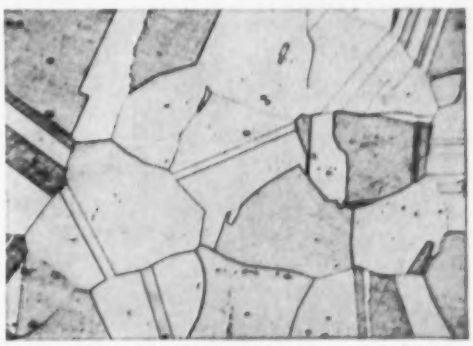
**3.** Complete elimination of gas, not from the surface only but from the entire mass. Alloys so produced are therefore more desirable in the manufacture of electron tubes.

**4.** General improvement in electronic, electrical, and mechanical properties to meet specifications. Because closer control of analysis is a primary advantage of vacuum melting, we can now achieve these specific improvements with remarkable certainty.

Almost all of the Driver-Harris Alloys now vacuum melted and processed under close physical and analytical control show improvement in one or more of the above ways. If you are seeking further improvements in the D-H Alloys you use, inquire now for information on how Driver-Harris Vacuum Melting Service can help you. Address your inquiry to Dept. VMS.



*Polished and etched sample of Air Melted NICHROME* V in annealed condition.*



*Vacuum melted NICHROME V, annealed. Note that reduced inclusions result in much larger grain size for the same annealing treatment.*

*T.M. Reg. U.S. Pat. Off.

Driver-Harris COMPANY HARRISON, NEW JERSEY

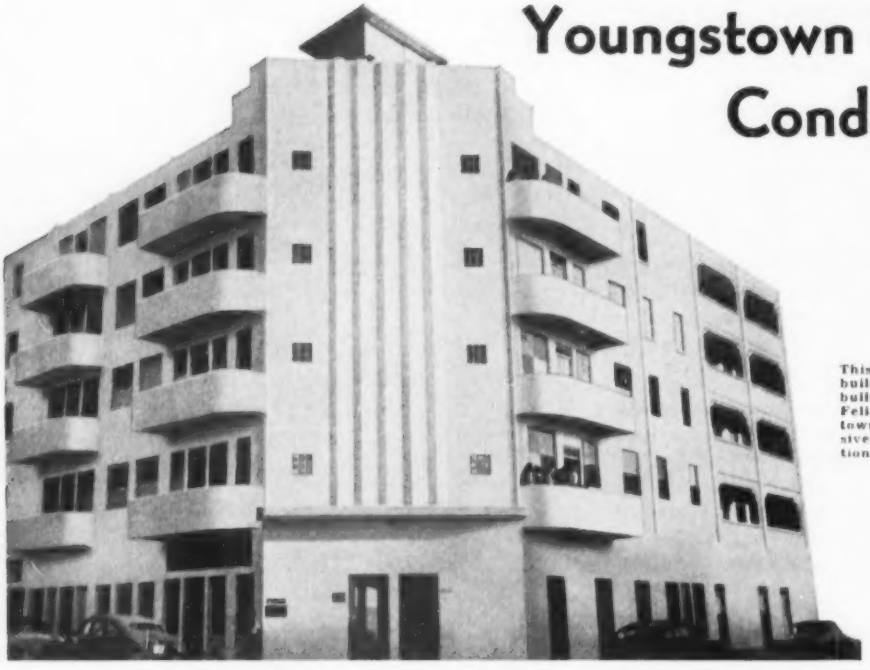
*Distributor:* ANGUS-CAMPBELL, INC. • 4417 S. Soto St., Los Angeles 58 • 760 Tennessee St., San Francisco 7

MAKERS OF THE MOST COMPLETE LINE OF ALLOYS FOR THE ELECTRICAL, ELECTRONIC, AND HEAT-TREATING INDUSTRIES

This 34-unit private housing project—known as "La Esperanza"—under construction by contractor Felix A. Torres utilizes "Buckeye" conduit exclusively.

## MODERN PUERTO RICAN HOUSING PROJECTS GET LIFE-TIME PROTECTION FOR ELECTRICAL SYSTEM BY USE OF

# Youngstown "Buckeye" Conduit



This modernistic 36-apartment building in Ponce, Puerto Rico—built and owned by contractor Felix A. Torres—utilized Youngstown "Buckeye" Conduit exclusively for wiring system protection.

In many of Puerto Rico's modern multi-story apartment buildings and private housing developments, Youngstown "Buckeye" Full Weight Rigid Steel Conduit has been used exclusively to give positive, safe, life-time protection for the electrical wiring systems. Electrical systems must function properly or they are definitely a bad investment. So to guarantee safe and efficient operation, leading owners, architects and contractors wisely specify Youngstown's "Buckeye" Conduit.

User's field reports tell us: " 'Buckeye' Conduit is easier to bend and thread—easier to fish wires through—and best of all, its superior corrosion resistance provides a much longer trouble-free service life."

Leading industrial and electrical distributors carry complete and ample stocks—to serve you with on-the-spot delivery. They're awaiting your phone call—today.

**THE YOUNGSTOWN SHEET AND TUBE COMPANY**

*Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices - Youngstown 1, Ohio

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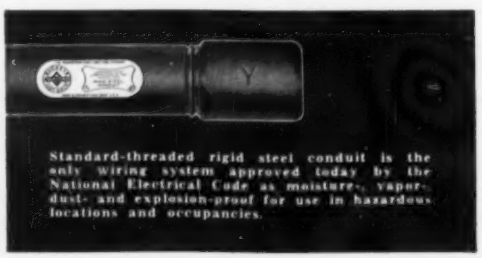


Standard-threaded rigid steel conduit is the only wiring system approved today by the National Electrical Code as moisture-, vapor-, dust- and explosion-proof for use in hazardous locations and occupancies.

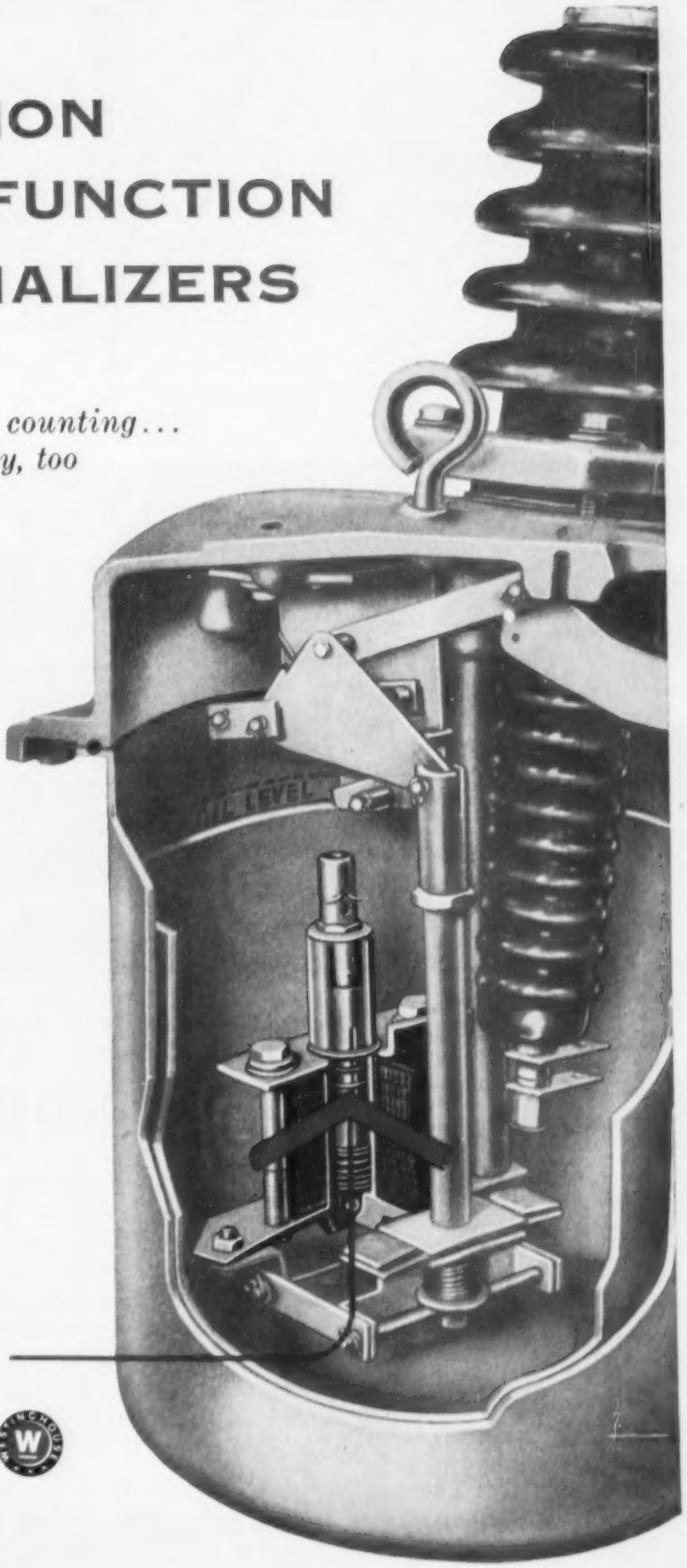
# COORDINATION IS A PRIME FUNCTION OF SECTIONALIZERS

*Only Westinghouse gives you absolutely precise counting... and greater current capacity, too*

By definition, a sectionalizer is an automatic switch which works in conjunction with power circuit breakers and reclosers to isolate local, permanent faults and thereby protect system service continuity. Its ability to coordinate with breakers and reclosers is therefore a paramount factor in evaluation.

Westinghouse sectionalizer coordination is positive. The Westinghouse sectionalizer will carry more than 50% greater current, continuously, and will accept momentary leads up to 6500 amperes. The Westinghouse Type GRS line is the most complete—nine current steps from 5 through 140 amperes—and voltage ratings to 15 kv.

Complete details are available from your Westinghouse sales representative. Also, you may write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania, for reprint No. 5090, an application and engineering AIEE paper on sectionalizer coordination concepts. J-60923

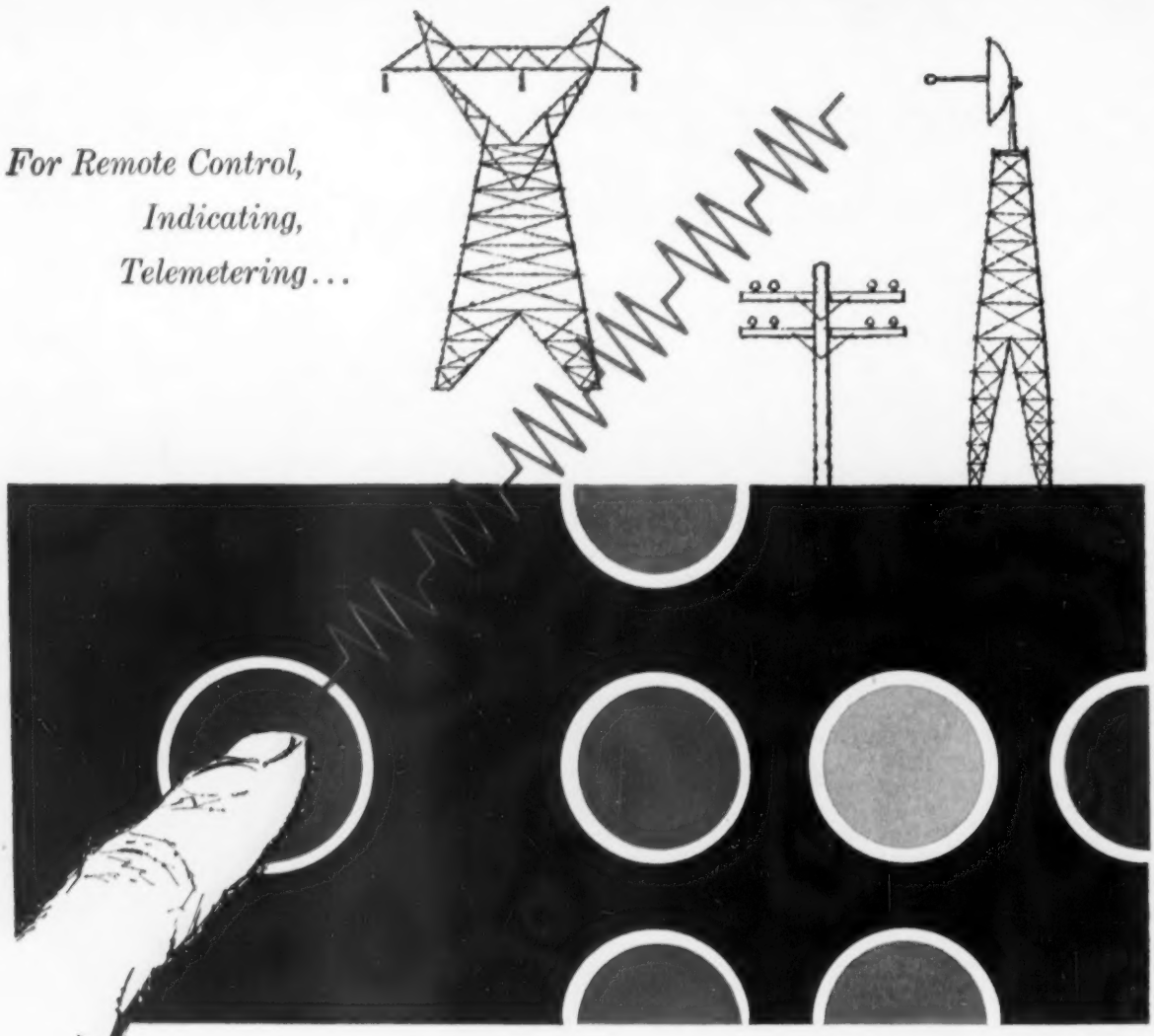



Consistent and accurate counting is assured by the patented magnetic rings in the integrator mechanism. During operation, the brass integrator piston is locked in each counting position by the magnet plate on top of the series coil.

YOU CAN BE SURE...IF IT'S

Westinghouse

*For Remote Control,*
*Indicating,*
*Telemetering...*



# WESTINGHOUSE SUPERVISORY SYSTEMS ...TOP DEPENDABILITY AND ECONOMY

Westinghouse built the *first* supervisory system thirty-five years ago—and it's still in everyday dependable service. Westinghouse has developed and built systems of every type, and today, as always, builds systems which excell in reliability and efficiency. They simplify your control communications and cut your operating costs by using inexpensive narrow-band channels instead of voice channels—on wire lines, power line carrier or microwave.

You can get full particulars from your Westinghouse sales representative . . . or by writing direct to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa., requesting descriptive bulletin 32-450 and reprint 4569.

J-60928

**YOU CAN BE SURE...IF IT'S Westinghouse**

*1612 years of fail-free service prove...*

# COMPLETE THREE-POLE PROTECTION IN ONE TANK

One answer to rising maintenance costs is the Westinghouse single-tank Type G breaker. More efficient use of oil, reduced maintenance hours and small space requirements add up to major maintenance savings. There are only two adjustments—mechanism stop and travel stop.

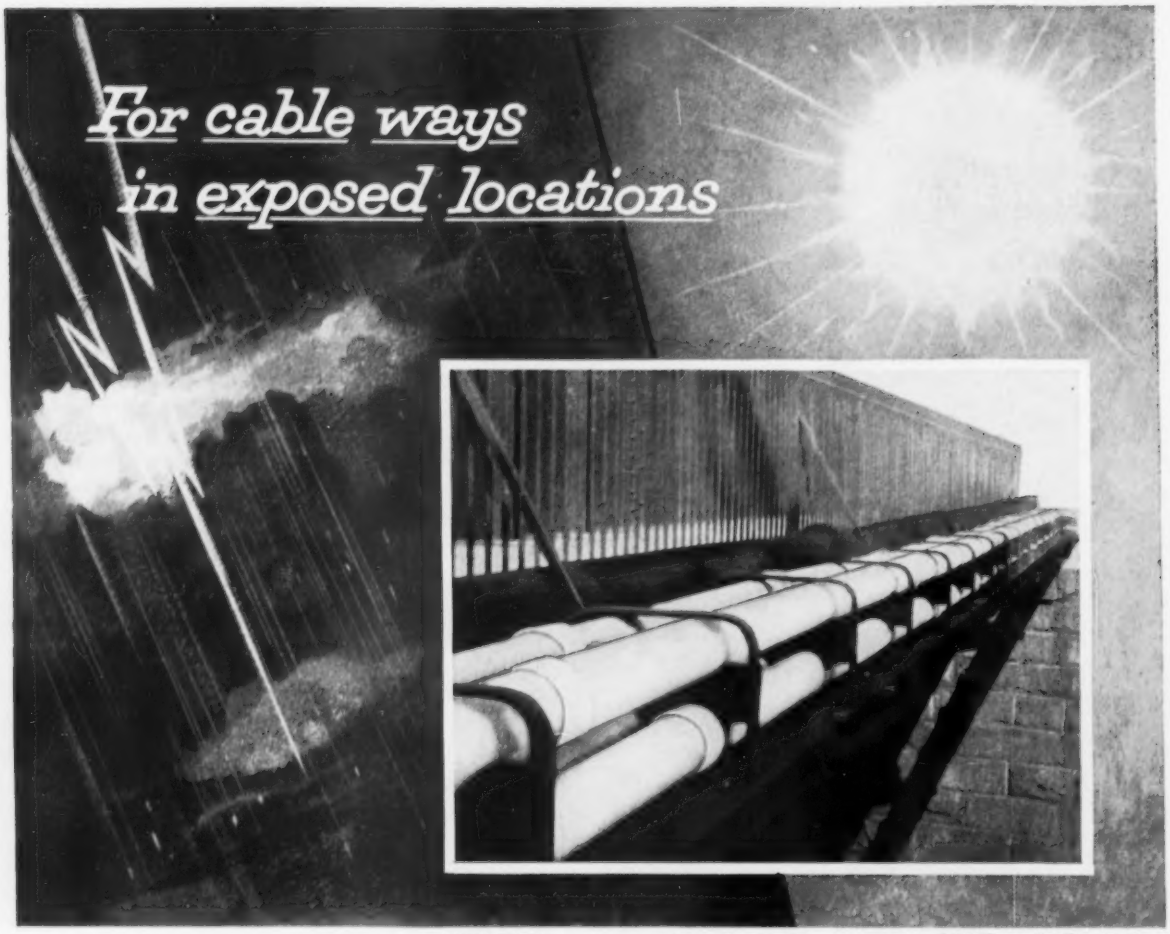
1612 breaker-years of service without failure assure this economy without compromise on protection.

The Westinghouse single-tank Type G breaker has a single De-ion® grid per phase—with exclusive Westinghouse design to shorten arc length and arcing time. Interrupting time is five cycles. Interrupting capacity is 100 or 250 mva at 14.4 kv—and 250 mva at 23 kv.

Complete details are available from your Westinghouse sales representative—or you may write direct to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania, requesting booklet B-5834. J-60927

YOU CAN BE SURE...IF IT'S

Westinghouse




**OUTDOORS** in extremes of weather and temperature—J-M Transite Ducts stay corrosion- and rot-free without paint or surface treatment of any kind.

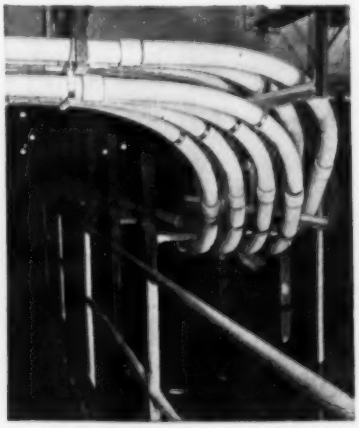
# J-M Transite® Ducts give long, trouble-free service ...never rust, rot, or corrode

Wherever you *see* conduit—in exposed locations indoors or out—you see more and more of the conduit that *really* protects—Johns-Manville Asbestos-Cement Transite Ducts.

**To cut circuit losses,** Transite provides complete circuit isolation with a non-conductive, non-inductive barrier of asbestos and cement. Because it is made of incombustible, completely inert materials, Transite protects adjacent cable runs from the flame and heat of burnouts even at extreme temperatures.

**To eliminate raceway maintenance,** Johns-Manville Transite Ducts offer you a raceway that is built to take exposure to weather and corrosive atmospheres. No need to paint and repaint—because Transite resists corrosion, fungus, and rot—resists the heat and flame of extreme-temperature burnouts.

Let us send you free brochure EL-29A. Write Johns-Manville, Box 14, New York 16, New York. In Canada: Port Credit, Ontario.



**INDOORS**—Transite's light weight, quickly assembled tapered couplings, and pre-shaped bends offer installation speed to match Transite's low maintenance requirements.

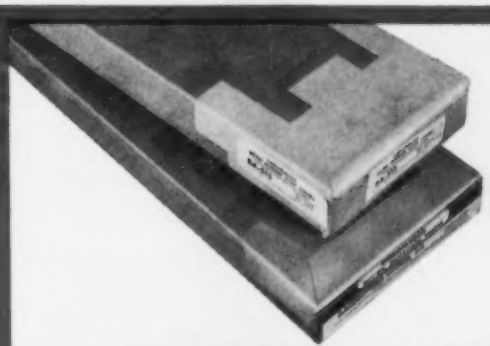
## Johns-Manville TRANSITE DUCTS

Made of Asbestos-Cement

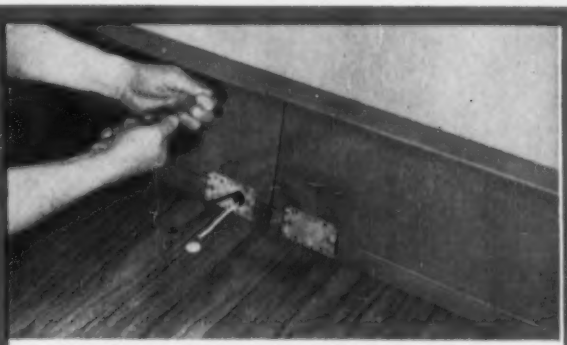
**J-M Conduit for exposed and underground installations without concrete**
**J-M Korduct® for installation in concrete**

# fast, simple installation

## helps make CHROMALOX® Electric Baseboards the Quality Line

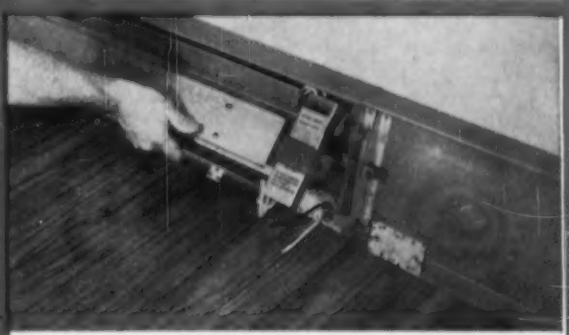


1 Chromalox Electric Baseboards are now packaged in a new exclusive two-carton arrangement. One carton contains the baseboard housing; the other carton contains the heater element assembly. No disassembly, damage or loss of parts on the job.



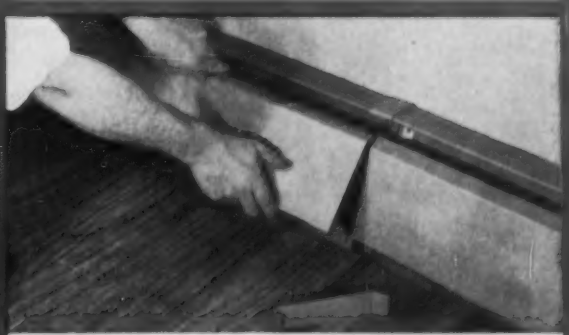
2 After wiring is roughed-in, plastering and flooring are completed, then back panel is fastened to wall. Wiring enters the versatile 4-way terminal box from rear, bottom or either side.

3 Supports for heater assembly are installed during fixture installation. Brackets slip fit into position.



4 Back panels can accommodate high-wattage or standard wattage heater assemblies in single or twin-heat, at voltage ratings of 120, 208 or 240 volts. High wattage assemblies contain thermal cutouts.

5 Wiring is simple. Terminal boxes are supplied at either end of back panel . . . allowing wiring as much as sixteen continuous feet of heat with only one set of connections.



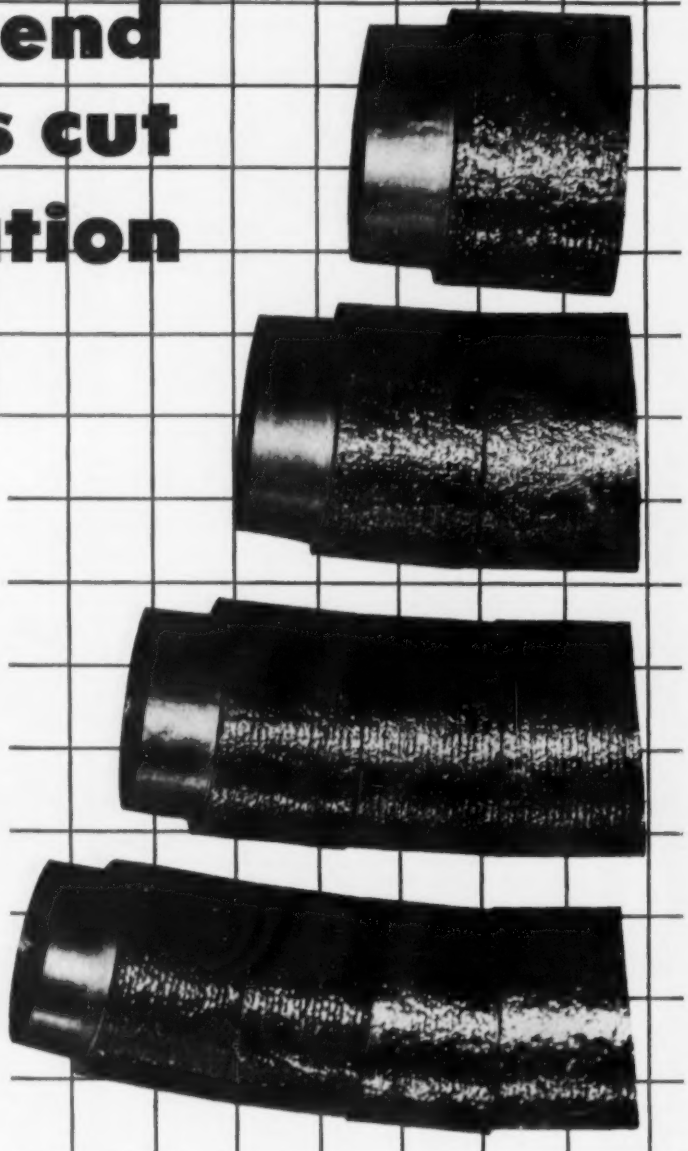
6 Front Covers, splice plates and corner pieces snap on. No screws or bolts to mar the smooth, streamlined appearance. The bonderized finish is ready for painting. Write today for the full story.

See our complete catalog in Sweet's Architectural, Light Construction and Industrial Files

*Edwin L. Wiegand Company*
*RESIDENTIAL HEATING DEPARTMENT*
*7540 Thomas Boulevard, Pittsburgh 8, Pa.*
*Heat Better . . . Electrically*

CHROMALOX FIRST NAME IN ELECTRIC HEAT

# These bend sections cut installation costs



Orangeburg 5° Bend Sections are the "on-the-job" answer to special bend problems. They get over, under or around those unforeseen obstructions . . . and do it easily and economically.

Crossovers . . . transformations . . . offsets . . . can be made in the field by joining sections together to obtain the desired direction change. No costly delays . . . no special bends needed.

Orangeburg 5° Bend Sections* are another reason why Orangeburg Fibre Conduit is the ideal protective raceway for underground electrical cables.

Distributed by Graybar Electric Company and General Electric Supply Company Branches and stocks in principal cities.

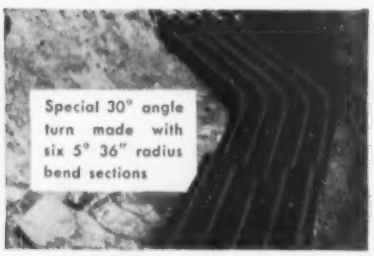
Write Dept. EW-67 for Bulletin S.E.C.

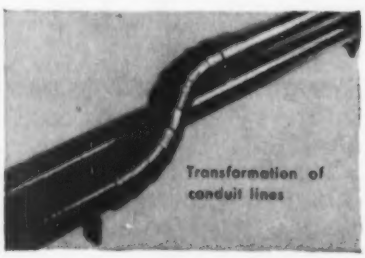
**Made for Orangeburg Standard Conduit only.*

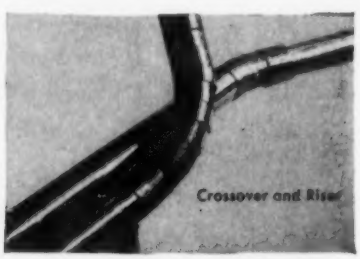
ORANGEBURG MANUFACTURING CO., INC.
Orangeburg, N. Y. Newark, Calif.

## ORANGEBURG®

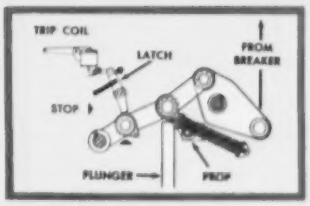
## FIBRE CONDUIT PROLONGS CABLE LIFE



# This Pneu-Draulic operated breaker is mechanically trip-free for positive protection




## Always full-speed opening!

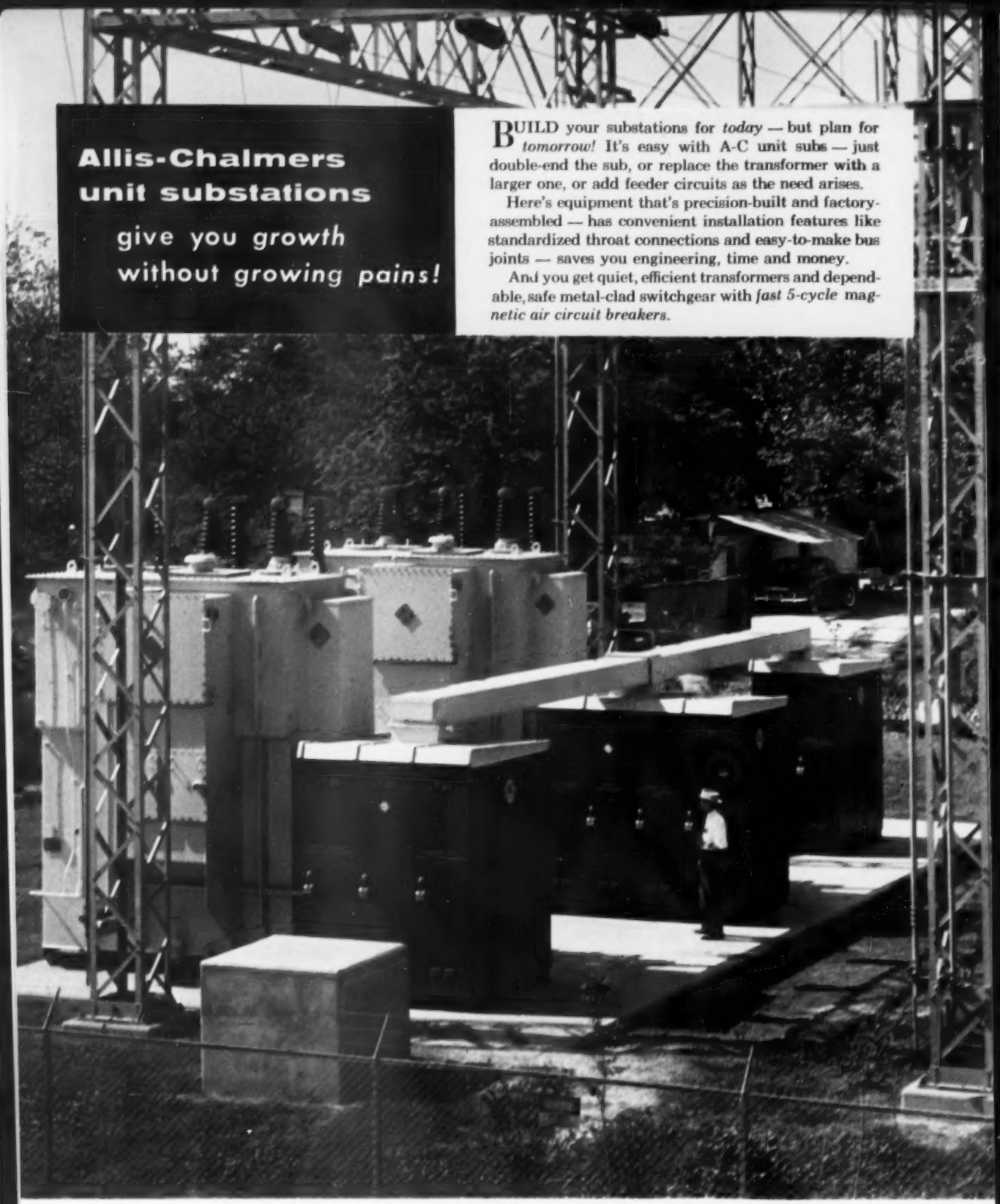
Only in mechanically trip-free breakers are contacts and closing mechanism completely uncoupled during tripping operation . . . enabling contacts to open at full speed without restriction from mechanism. Breakers that are only pneumatically or hydraulically trip-free cannot give you this protection.

*Pneu-Draulic is an Allis-Chalmers trademark.*

*Get details on this and other features of Allis-Chalmers breakers. Call your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wis.*

A-5238

# ALLIS-CHALMERS



## Allis-Chalmers unit substations

give you *growth* without *growing pains!*

BUILD your substations for *today* — but plan for *tomorrow!* It's easy with A-C unit subs — just double-end the sub, or replace the transformer with a larger one, or add feeder circuits as the need arises.

Here's equipment that's precision-built and factory-assembled — has convenient installation features like standardized throat connections and easy-to-make bus joints — saves you engineering, time and money.

And you get quiet, efficient transformers and dependable, safe metal-clad switchgear with *fast 5-cycle magnetic air circuit breakers.*

A-5245

*For details regarding A-C unit substations, contact your nearby A-C office, or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.*

**ALLIS-CHALMERS** *for progress in switchgear*

# NUCLEAR NEWS FROM ATOMICS INTERNATIONAL

## AI develops reactors for largest power plants and smallest research labs

A wide selection of nuclear reactors, ranging in size from a 75-megawatt nuclear power plant to generate electricity, to a 5-watt laboratory instrument, have already been completed, or are at present under construction by ATOMICS INTERNATIONAL.

**The Sodium Reactor Experiment,** part of the Atomic Energy Commission's program to develop economical nuclear power, now undergoing tests in the Santa Susana Mountains near Los Angeles, will have an output of 20 thermal mw and will generate about 6.5 mw of electric power. It is the prototype of a full-scale sodium graphite reactor design, which will have a power output of 75 to 125 mw. ATOMICS INTERNATIONAL regards it as a promising reactor type for economical power generation.

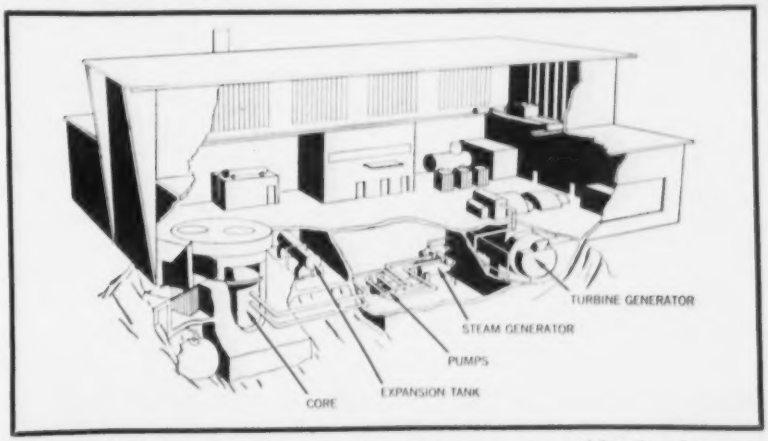
**The Organic Moderated Reactor,** a relatively new approach to economical nuclear power, is particularly appropriate for smaller plants. ATOMICS INTERNATIONAL is completing construction of the Organic Moderated Reactor Experiment for the Atomic Energy Commission at the National Reactor Testing Station in Idaho, part of a development program for the OMR. Basic advantages of the OMR include compact core with good neutron economy, low pressure coolant system, and freedom from corrosion problems. The OMR is also considered promising for ship propulsion, and ATOMICS INTERNATIONAL is making a design study of this reactor type for maritime use.

**Research Reactors** are now being built by ATOMICS INTERNATIONAL for Japan, Denmark, West Germany, and West Berlin. They are similar to the ATOMICS INTERNATIONAL reactor now in service at Armour Research Foundation, Chicago—the first to be designed specifically for private industrial research.

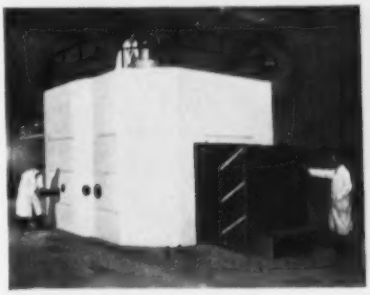
**The Laboratory Reactor** is a new, low-cost instrument designed specifically to meet the needs of universities and industrial laboratories for nuclear training and research.

ATOMICS INTERNATIONAL, one of America's major builders of nuclear reactors, is staffed and equipped to help you with any phase of reactor development. Please write: Director of Technical Sales, Dept. ET-73, ATOMICS INTERNATIONAL, P. O. Box 309, Canoga Park, Calif. Cable address: ATOMICS.

**Reactor "heart".** An AI technician installs zirconium "cans" containing the graphite moderator in the core of the Sodium Reactor Experiment. The use of a sodium coolant allows a high-temperature, low-pressure heat extraction system with high thermal efficiency of power conversion.




**Typical OMR** Central Station Power Plant. Basic advantages of OMR include small size, compact core, low-pressure system, and freedom from corrosion problems. This also makes it a promising reactor for ship propulsion.



**Armour Reactor** is a 50 kw water-boiler unit for industrial research. It has nine beam tubes for experimental purposes.

**Nuclear Nutshell.** Laboratory Reactor operates at 5 watts of power and produces more than 100 isotopes. It can be operated by one trained man.

AI
ATOMICS INTERNATIONAL
A DIVISION OF NORTH AMERICAN AVIATION, INC.
PIONEERS IN THE CREATIVE USE OF THE ATOM

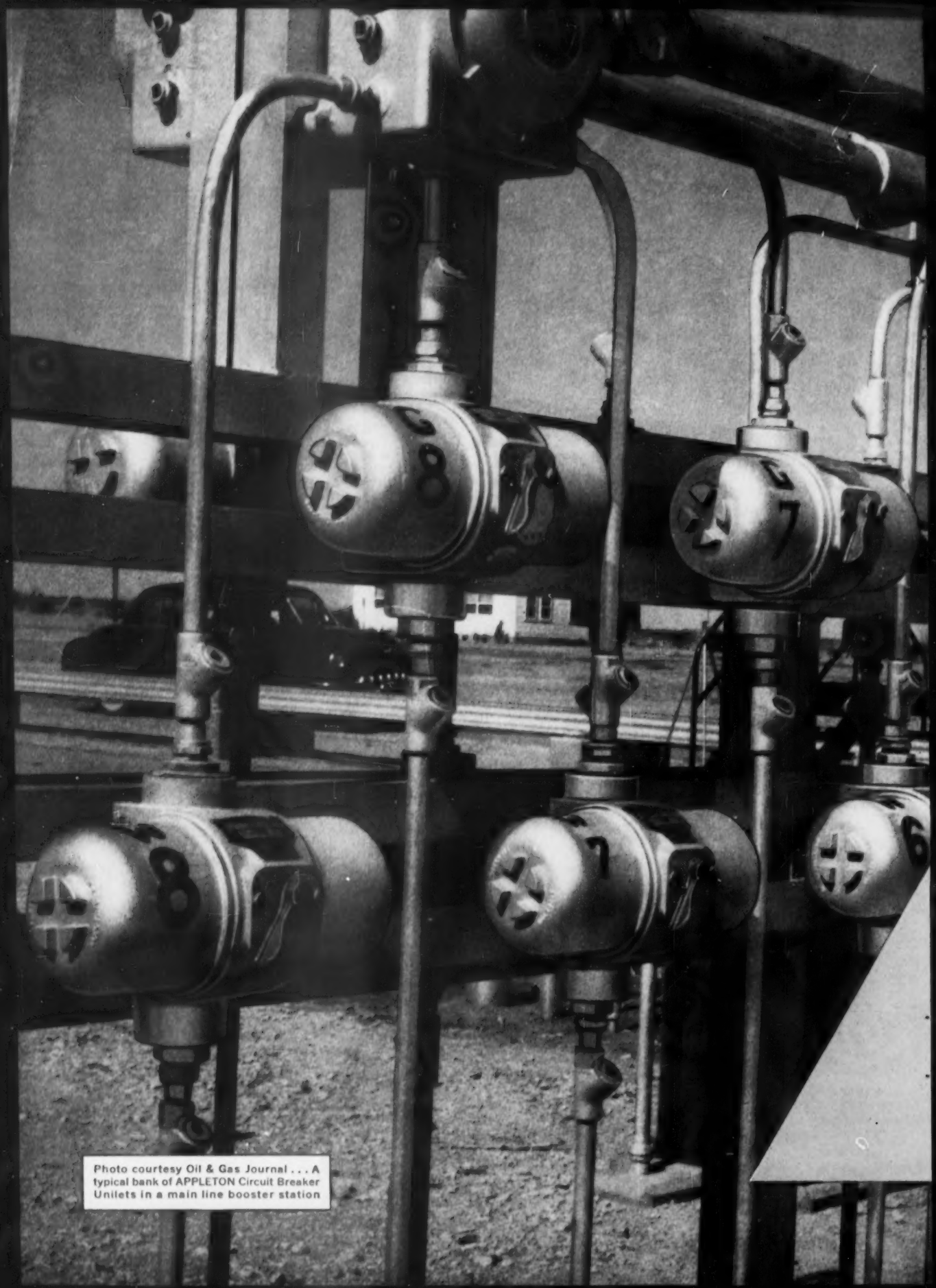


Photo courtesy Oil & Gas Journal . . . A typical bank of APPLETON Circuit Breaker Unilets in a main line booster station

*The Choice of America's Leading Electrical Engineers*

# APPLETON

**CIRCUIT BREAKER, MOTOR STARTER and COMBINATION MOTOR STARTER**

# UNILETS®

**APPLETON** Circuit Breaker and Motor Starter Unilets . . . your best choice for positive lasting protection against explosion, dust, and rain! Regardless of the installation, where absolute safety is required . . . APPLETON can serve you better!

**7 REASONS FOR APPLETON SUPERIORITY**

**1. Full 7-thread explosion-proof protection. 2. Unmatched accessibility. 3. Compact, lightweight construction. 4. Unit may be added quickly, easily. 5. Flexible field set-ups with single and duplex male and female hub adapters. 6. Combinations meet U.L. requirements through approval of components. 7. First to be U.L. approved for banked circuit breaker grouping.**

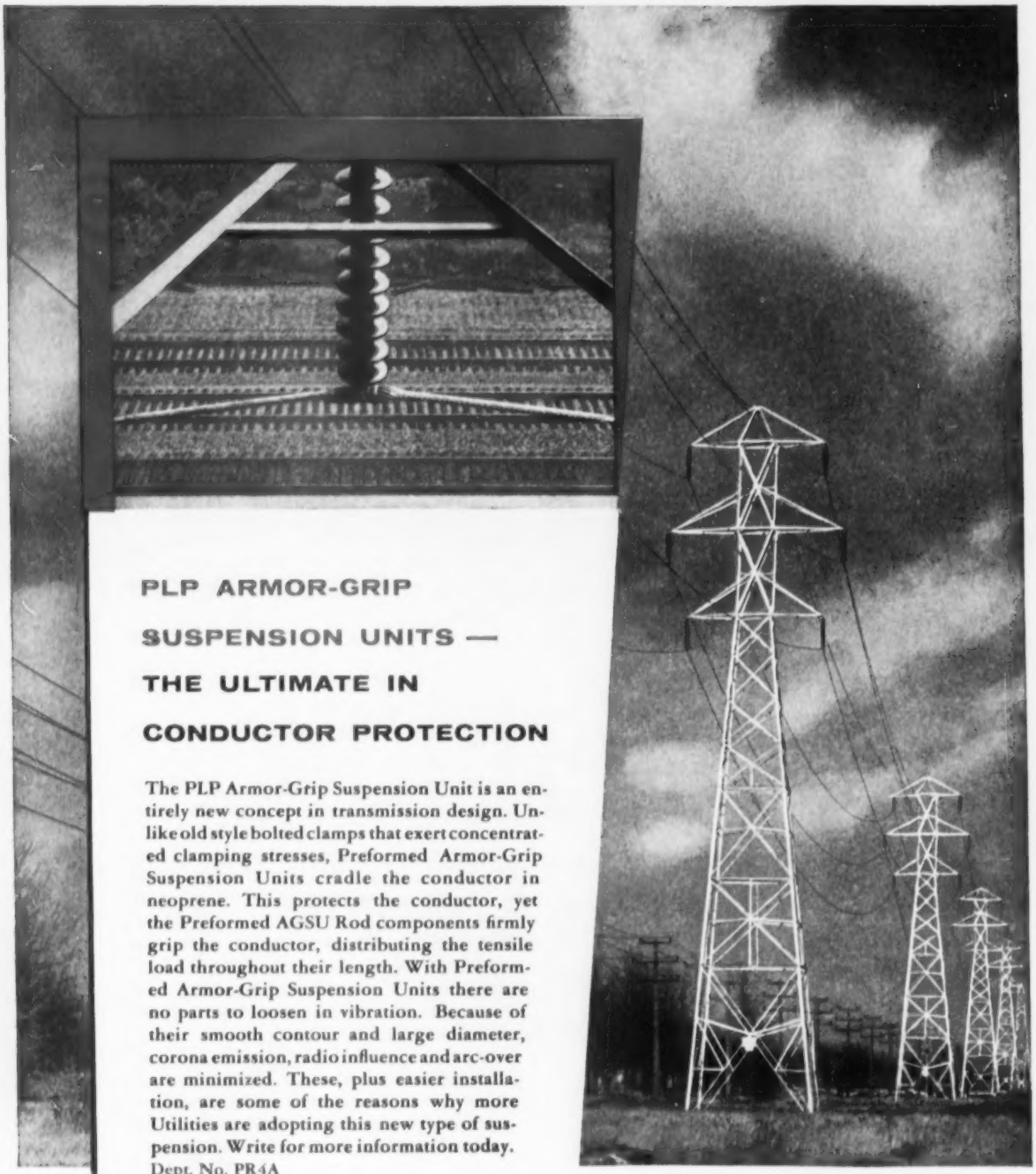
**SOLD THROUGH FRANCHISED WHOLESALERS ONLY**

*Also Manufacturers Of:*

**APPLETON ELECTRIC COMPANY • 1709 Wellington Avenue • Chicago 13, Illinois**

APPLETON ELECTRIC PRODUCTS

*Rely on APPLETON . . . The Standard for Better Wiring*



## PLP ARMOR-GRIP SUSPENSION UNITS — THE ULTIMATE IN CONDUCTOR PROTECTION

The PLP Armor-Grip Suspension Unit is an entirely new concept in transmission design. Unlike old style bolted clamps that exert concentrated clamping stresses, Preformed Armor-Grip Suspension Units cradle the conductor in neoprene. This protects the conductor, yet the Preformed AGSU Rod components firmly grip the conductor, distributing the tensile load throughout their length. With Preformed Armor-Grip Suspension Units there are no parts to loosen in vibration. Because of their smooth contour and large diameter, corona emission, radio influence and arc-over are minimized. These, plus easier installation, are some of the reasons why more Utilities are adopting this new type of suspension. Write for more information today.
Dept. No. PR4A

PX-79

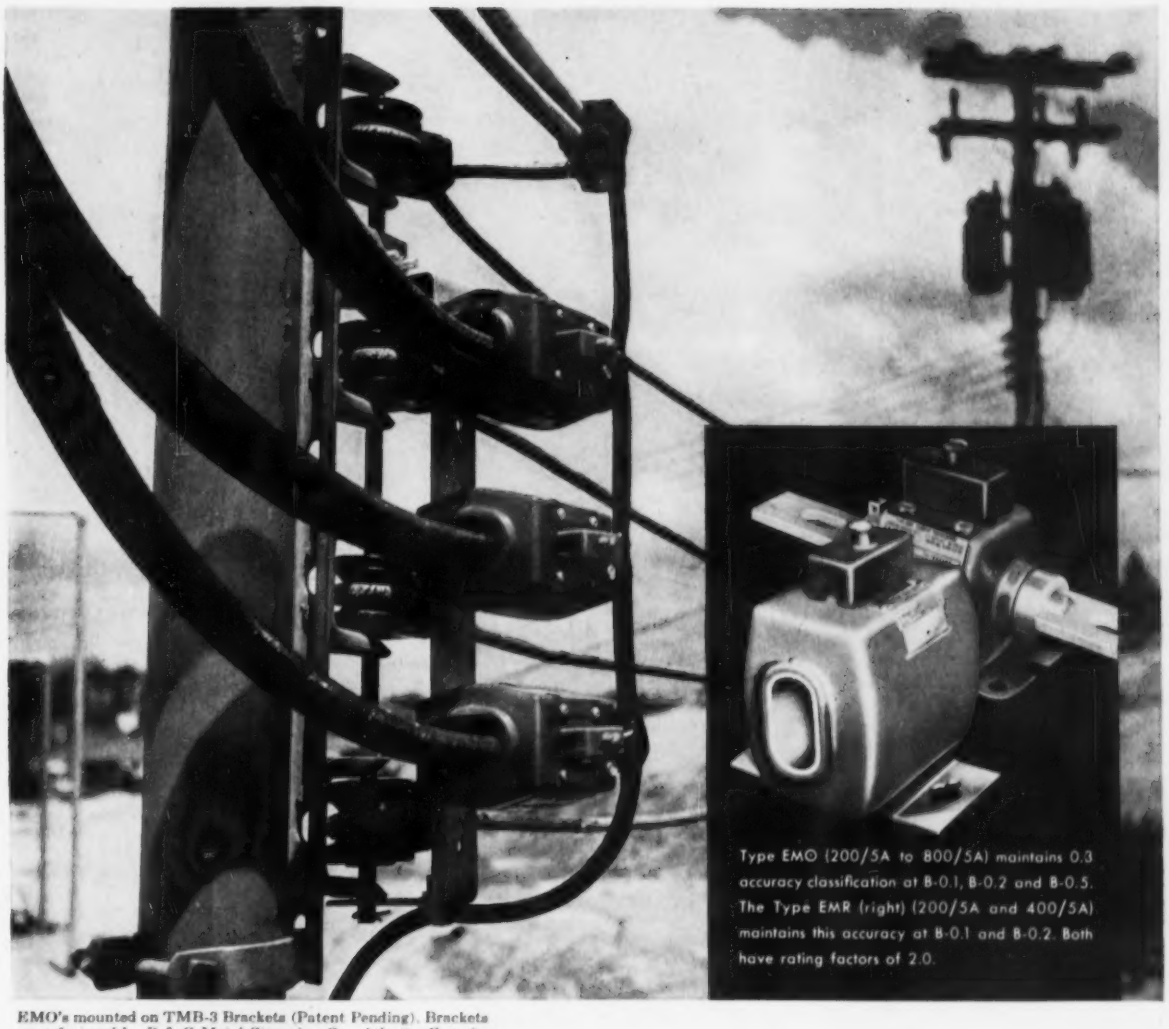
PLP Armor-Grip Suspension Units support these 132 KV Cleveland Electric Illuminating Company lines.

**PREFORMED LINE PRODUCTS CO.**

5349 ST. CLAIR AVENUE • CLEVELAND 3, OHIO

*Telephone: Cleveland EXpress 1-3571*

Made in accordance with or for use under one or more of the following U. S. Patents: 2,722,393; 2,275,019; 2,587,521; 2,609,653; 2,691,865; other patents pending.



Type EMO (200/5A to 800/5A) maintains 0.3 accuracy classification at B-0.1, B-0.2 and B-0.5. The Type EMR (right) (200/5A and 400/5A) maintains this accuracy at B-0.1 and B-0.2. Both have rating factors of 2.0.

EMO's mounted on TMB-3 Brackets (Patent Pending). Brackets manufactured by B & C Metal Stamping Co., Atlanta, Georgia.

## EMO Indoor/Outdoor Metering Transformer . . . 600-Volt Class, 200-800 Amps

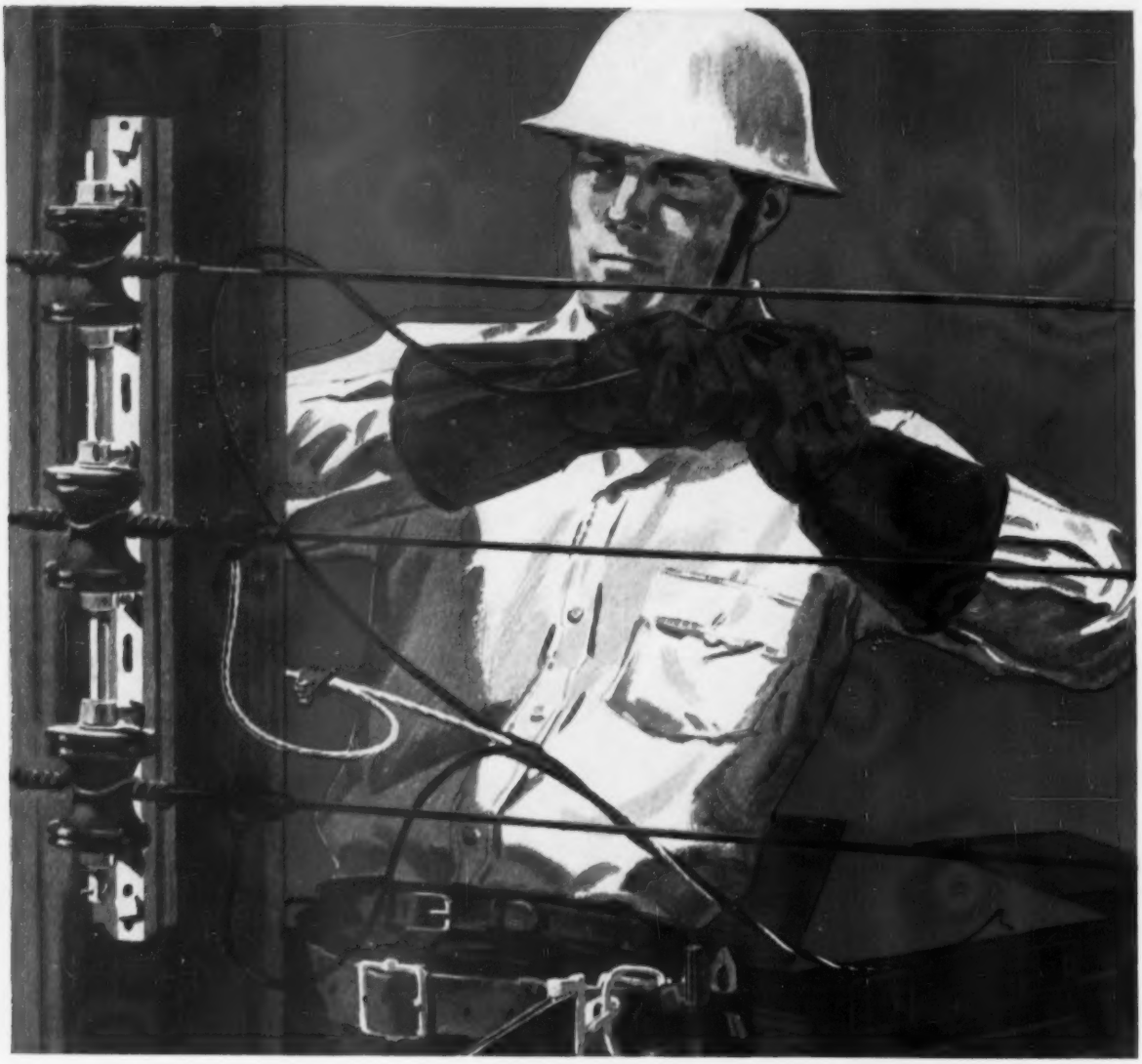
# 50% greater cable capacity

Now molded from a polyester elastomer insulating material, product of Westinghouse research, the Westinghouse Types EMR and EMO current transformers are *five ways superior to any comparable units.*

1. **50% Greater Cable Capacity**—exclusive obround primary opening—the EMO above (200/5A.) handles two 750 MCM cables, 50% more than comparable units. The EMR features a round primary opening, with optional, removable round or flat terminal bar.
2. **Positive, Permanent Cable Connections**—exclusive Ilsco-type secondary terminals (Underwriters' listed) with weatherproof covers provide more positive, permanent connections.
3. **Longer Life**—polyester molding gives outstanding protection against weather, and corrosive acid or alkali fumes. *These transformers are ideal for either indoor or outdoor installation.*
4. **Smaller, Lighter**—polyester molding, plus the new design, has reduced the size and weight of these units, simplifying installation.
5. **Unexcelled Thermal and Dielectric Stability**—physical flexibility is maintained at high and low temperatures.

For full details, call your Westinghouse representative, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-70800

**YOU CAN BE SURE...IF IT'S Westinghouse**



***Triplex*** —combining three wires in one compact assembly—makes possible neater services, fewer attachments, easier installations—for big savings.

***ACSR*** that can meet or exceed your toughest requirements. Put Kaiser Aluminum's growing leadership in extra high-voltage research to work for you today!

***Power Cable*** that eliminated 26 competitive cables in time periods of from zero to 2,509 hours of a High Ozone Attack test—then went on to 6,000 hours.

***Weatherproof*** —One of the nation's leaders in covered conductor, Kaiser Aluminum supplies the finest distribution, secondary and service cable in the field.

***AAAC,*** developed and introduced by Kaiser Aluminum! Gives greater strength in high conductivity and is stronger than All Aluminum Conductor.

# IF IT CARRIES CURRENT

# KW CARRIES IT!

***Now! Unsurpassed benefits for electrical distributors due to Kaiser Aluminum's recent purchase of the Wire and Cable Division of U. S. Rubber, located at Bristol, Rhode Island!***

***Now from one source,*** you get all the established KW products plus all products of the new Bristol mill (formerly Wire and Cable Division of U.S. Rubber). For former U.S. Rubber products, the same quality insulations and product guarantee terms will be continued.

***Now from one source,*** you get the most advanced technical assistance in the industry—the full cooperation of the research and development leaders of both aluminum and copper conductors.

***Now from one source,*** better-than-ever service—from two plant locations (Newark, Ohio and Bristol, Rhode Island). This includes service from the production, engineering, sales and distributor organizations of both Kaiser Wire and the former Wire and Cable Division of U.S. Rubber.

For immediate attention to any request for electrical conductor products, engineering and research service, or further information, contact your nearest Kaiser Aluminum sales office or the KW distributor listed in your telephone directory.

Kaiser Aluminum & Chemical Sales, Inc., *Executive Office,* Kaiser Building, Oakland 12, California; *General Sales Office,* Palmolive Building, Chicago 11, Illinois.

# Kaiser Aluminum

***the bright star of metals***

***Portable Cord*** that gives you three times longer life than the average of molded cords of other makes. It's *proved* by 12,000 tests over a 3-year period.

***Portable Cable:*** "It's the toughest, most flexible trailing cable we've ever used in our mines," says general superintendent of coal mining company.

***Control Cable,*** backed by 67 years of experience in electrical wire and cable manufacturing. That means dependability—*proved security* for public safety!

***Service Entrance Cable,*** now UL-approved for 75° wet applications! Improved design characteristics include pleasing appearance and ease of application.

# Hotpoint Electric Ranges

## women-tested features that build sales...load...revenue!

- "Fashion-Front" Styling
- Colortones
- Color-Lighted Pushbuttons
- Two-Way Super-Matic—Choice of 6″ or 8″ Unit
- Automatic Time Control of All Surface Units
- Musical Meat Thermometer
- 1½ Gallon Coffee-Perk
- Super Fast "Super 2600" Calrod® Unit • Silver Grey Ovens
- All-Calrod—Surface *and* Oven
- Rota-Grill Rotisserie
- Handi-Over Grill
- Handi-Raise Broiler
- Golden Griddle • Thrift Cooker
- Automatic Reset Oven Timer

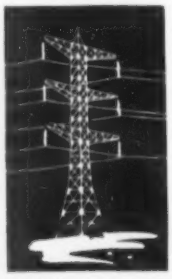
## HELPING YOU SHAPE THE BIGGEST TOMORROW...EVER!

Here's the Electric Range that puts more *salespower* behind "HOUSEPOWER," more *living* in "LIVE BETTER . . . Electrically"! That's because Hotpoint made hundreds of studies to determine what your women customers want in an electric range—then designed models and features to specifically meet those demands!

Let Hotpoint Automatic Electric Ranges help you shape the biggest tomorrow—*ever!* Hotpoint's women-tested features offer the shortest distance between the sales floor and more electric ranges on your lines. And, when Hotpoint's hard-hitting national advertising and imaginative sales-promotion are tied-in with the "HOUSEPOWER" and "L.B.E." programs, you can boost your electric range sales, load and revenue to more profitable levels.

**Have your Hotpoint Distributor show you the *complete* Hotpoint Range Line for '57 . . . 6 NEW 39-inch models and 3 NEW 30-inch models!**

*Again,* Hotpoint



LIVE BETTER ELECTRICALLY

*looks at Tomorrow, Today!*

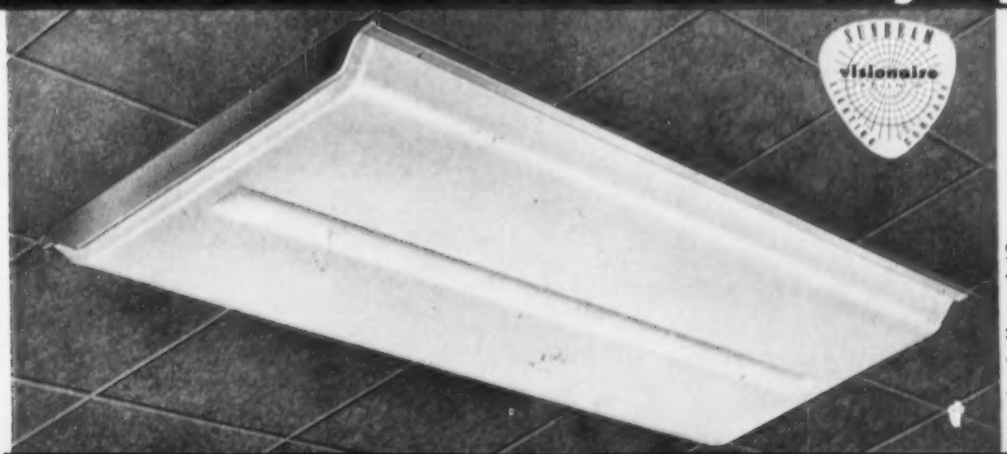
**HOTPOINT CO.** *(A Division of General Electric Company)* ***5600 Taylor Street, Chicago 44, Illinois***

# CONTEMPORARY LIGHTING WITH AMAZING SIMPLICITY

Here's surface-mounted lighting with a big difference: the luminous, all-white SHALLORAMA.® A new Sunbeam Lighting development, it represents a never-before-achieved combination of extreme shallowness and unusual even brightness control. Designed for new or remodelled interiors, it is especially suitable to today's trend to lower ceilings. All metal components are die-formed for uniform, precision construction. The matte white, wrap-around Plexiglas is sturdily framed and has continuous hook-on ledges for opening from either side. No hooks, hinges, latches, light or dark streaks mar the sleek SHALLORAMA® beauty.

*Installation is a swift and simple procedure: remove assembled fixture from carton, secure to ceiling with normal two-screw mounting, attach leads and the job is done. Don't worry about uneven ceilings either; the integral jack-type levellers assure precision alignment.*

Patent Pending **SHALLORAMA a new dimension in lighting**




Write for Bulletin A-63.

SUNBEAM LIGHTING COMPANY, 777 EAST FOURTEENTH PLACE, LOS ANGELES 21, CALIFORNIA

Westinghouse
KILOWATT HOURS
Westinghouse
INTERVAL
RECORDER
NUMBER

*Helping the industry meet its growing loads*

# *"Red tape" that saves you money*

It is magnetic recording tape employed in a Westinghouse load survey recording meter.

The recorder is a development resulting from a need of Electric Utility management for a recording unit which is accurate, inexpensive and less demanding of man-hours.

The recorder utilizes both recording tracks of the standard tape at the same time. One side records time intervals, and the other records demand impulses—up to 240 per interval. The recorder may be used in conjunction with standard A-base or socket-type meters. Operation speed is such that the recorder will complete a full 32-day cycle on a single 600-foot reel of tape.

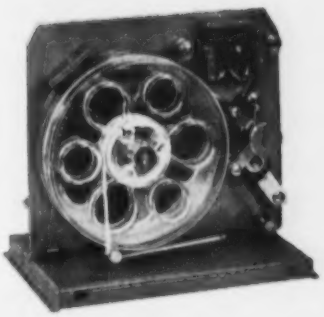
A translator has also been developed for "playback" of the recorded tape—through an IBM 526 Printing Summary Punch. A full reel may be translated—and the information put on permanent record IBM cards—in 35 minutes or less—without the requirement of engineer-interpreters, card-punch machine operators and the like.

Information is so applied to the cards that practically any combination of load facts may be made quickly through application of an IBM card sorter.

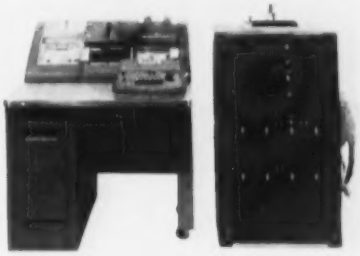
In short, this is automation applied to your ever-present problem of determining load growth and load shift—and planning and adjusting your generation and distribution to match it efficiently and profitably. J-97209

YOU CAN BE SURE...IF IT'S

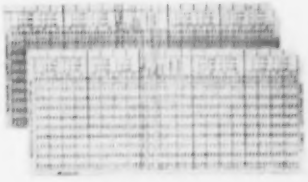
Westinghouse



**The Recording Mechanism.** Accommodates standard 5" tape supply and rewind reels. Powered by 240-volt synchronous motor, operating at 2.35 inches per 15-minute interval. Recorder units interchangeable—simply "plug in" through bottom of meter-recorder case.



**The Translator.** Tapes are processed at 3¾" per second on 15-minute interval recordings, 7½ inches per second on 30-minute interval surveys. Processing of 600-foot tape on 15-minute interval requires 35 minutes—18 minutes for 30-minute interval recordings. Interconnects with IBM 526 Printing Summary Punch machine.



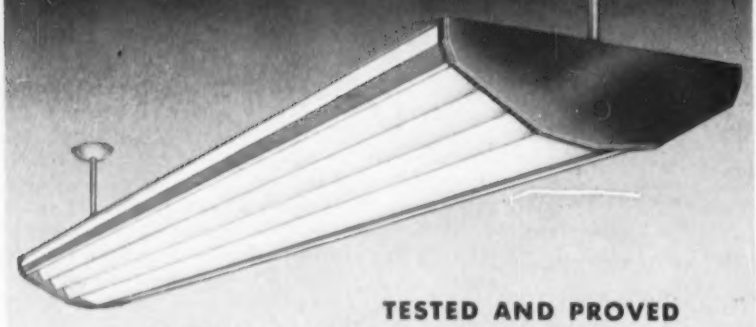
**Permanent Record Delivered on IBM Cards.** Cards provide for 80 columns of information and 12 positions in each column—plus customer and survey information, date and day of survey. On 15-minute interval surveys of 30-day duration, a total of 2880 demand readings are recorded, trans-speed of printing card punch. No interpreters required.

when you want

# THE FINEST...

Specify Leadlighter!

PATENTED*



**TESTED AND PROVED**
**WHERE IT COUNTS...IN ACTUAL USE!**

Five years ago Leadlighter was introduced to the lighting industry as a new solution to the problem of high illumination levels and low brightness. Today it has become a proven design, tested in the best way possible, *by actual use in many large installations.* See it in San Diego in the **National Steel and Ship Building** offices, the **Education Center** or the **County Branch Court** building... in Menlo Park at the **Hublein Distillery Co.**... in Fresno at the **Swift Ave. School**... in Pasadena at the **Pasadena Star News**... in Panorama City at the **Metropolitan Life Insurance Co.**

Leadlighter, with up to 80% efficiency, complete luminosity over the entire bottom of the fixture, and self-cleaning vanes, offers illumination quality not possible in any other fixture.

Leadlighter can do a job for you, too. Call or write us. One of our lighting engineers will be glad to answer all your questions.

**LEADLIGHT FIXTURE CO.**
800 100th AVENUE, OAKLAND, CALIF.
PHONE SWeetwood 8-7760

*PAT. NO. 2,703,360

# *ELECTRICAL BOOKS*

RECOMMENDED PRACTICE FOR OFFICE LIGHTING, 29 *pages*, 8½x11, *Illuminating Engineering Society*, 50c.

This new report by the IES committee on office lighting includes results of consultation over the past six years with the committee on school lighting, the American Institute of Architects and the National Council for Schoolhouse Construction.

PRECISION ELECTRICAL MEASUREMENTS, 8½ x 11, *Philosophical Library*, $12.

This is a collection of 26 papers presented at an international symposium on the techniques of precision electrical measurement held at Middlesex, England, in November 1954. Four of the authors are from the U. S. National Bureau of Standards. The proceedings are divided into five parts dealing successively with techniques applicable to electric fields and dielectrics, magnetic fields and associated materials, electrotechnical measurements, standard techniques for high-voltage measurement and for impulse testing.

PROCEEDINGS, WORLD SYMPOSIUM ON APPLIED SOLAR ENERGY, 304 *pages*, 8½x11, *Association for Applied Solar Energy*, $5.

The full proceedings of the World Symposium on Applied Solar Energy held in Phoenix in 1955 are contained in this book. Papers by 30 internationally recognized authorities on solar energy utilization are presented. A summary of a round-table discussion on "The Future of Applied Solar Energy" is included in the book.

NEW FRONTIERS FOR PROFESSIONAL MANAGERS, 128 *pages*, 8x8, *by Ralph J. Cordiner, McGraw-Hill Book Co.*, $2.75.

Contents of this book are based on lectures and discussions of the first McKinsey Foundation lecture series, sponsored by the Graduate School of Business, Columbia University. Formulation of the ideas presented in the book began with General Electric's studies of the place and prospects of major corporations in a tremendously expanding economy. The problem of how such companies should be organized and managed for continuing good of their shareholders, employees, customers and the nation as a whole is a primary concern of these studies.

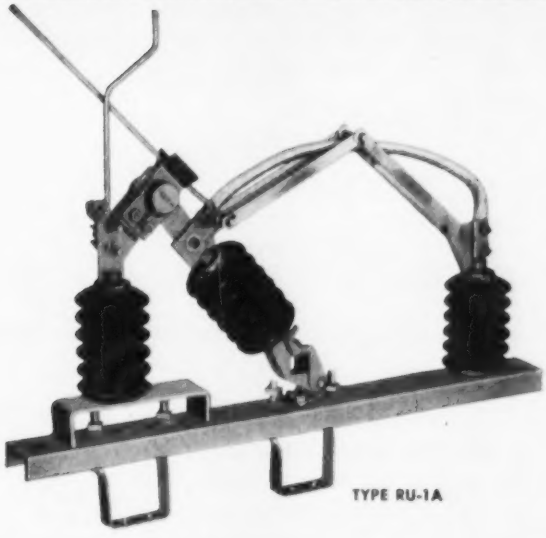
ELECTRICAL TESTING AND TROUBLESHOOTING, 191 *pages*, 6x9, *by Philip T. Green, The Industrial Press*, $4.

Methods of locating and correcting faults in circuits of all kinds, including controllers, motors, transformers and transmission lines, are included in this book. Troubleshooting procedures described have been field tested and proved to be time savers. Only a basic knowledge of simple arithmetic is required for understanding principles and procedures given.

THE ART AND SCIENCE OF PROTECTIVE RELAYING, 410 *pages*, 6x9, *by C. Russell Mason, John Wiley & Sons*, $12.

Reference material and refresher information for relay engineers are carried in this book. It is the outgrowth of notes used in the General Electric power systems engineering course. Among features is relay protection of all elements of a power system against all abnormal operating conditions

# For low-cost switching choose a Southern States tilting insulator disconnect




## TWO COMPLETE LINES

When easy, low-cost installation is the first requirement for disconnecting switches, Southern States offers you not one —but two complete lines from which to choose.

The Type TR-1A is a high-quality rocker-type disconnect that meets NEMA Standards in every respect. It is available in voltage ratings from 7.5 kv through 69 kv and continuous current ratings of 200, 400, and 600 amps.

The Type RU-1A is a distribution level tilting insulator switch specifically designed for pole-top mounting. Its dielectric strength is the same as standard levels for other distribution equipment, but it is below NEMA Standards for power switching equipment. It is available in voltage ratings of 7.5 and 15 kv and continuous current ratings of 200 and 400 amps.

Both types are ruggedly constructed, and will provide reliable switching under all service conditions. Many utilities throughout the nation have found in these switches the answer to their needs for low-cost, easily installed disconnecting switches. So can you. Get full details in our Bulletins 54 RU and 3050.

## EASY INSTALLATION

One reason utilities find the installation of these switches so easy is the method for affixing the interphase shaft to the rocking insulator. The shaft is laid in its proper position across all three phases and then only one bolt per phase is tightened to complete the installation, saving valuable installation time in the field.

**SOUTHERN STATES**
**EQUIPMENT CORP.**
HAMPTON, GEORGIA

IN CANADA: Dominion Cutout Co., Ltd., Toronto

*A question for every electric utility*

# JUST HOW FLEXIBLE CAN POWER SUPPLY GET?

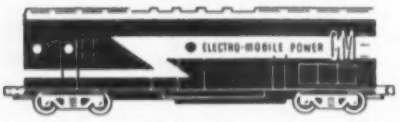
Giant strides to improve flexibility of supply to customers have been taken in recent decades by the electric utility industry. Today power availability must anticipate load growth more than ever before. Inter-connected supply permits transferal of power from one area to another as varying geographical load demands or emergency situations arise.

Even greater flexibility, however, can be attained—by means of Electro-Mobile Power. Truck-trailer or rail units permit shifting increments of power from place to place as demands change. Units can be used singly or in multiple—added like building blocks to match requirements exactly. And provision for impulse starting and stopping allows unattended operation from any location in the system.

Moreover, the placement of Electro-Mobile Power close to the load not only relieves the central station of a block of power, but also reduces the line loss between the central station and the load for that block of power. This is a major factor at time of peak.

Just how flexible can service get? Far more flexible than you might imagine with present equipment if Electro-Mobile Power is employed to answer additional requirements. A joint analysis of your system can reveal the savings and increased flexibility possible with these units. Contact your Electro-Motive representative for full information.

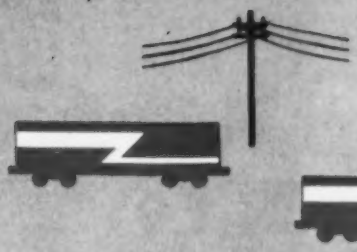
*Electro-Mobile Power adds to system flexibility in many ways*



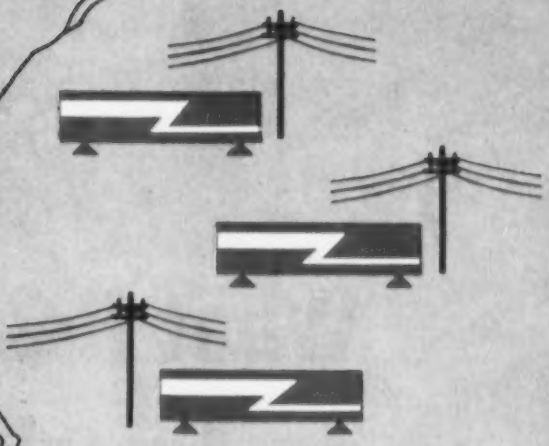

**RAIL CAR**—1000 kw units for use on sidings or placed on piers for semi-permanent use.

**TRUCK TRAILER**—500 kw units offer excellent mobility for many temporary applications.

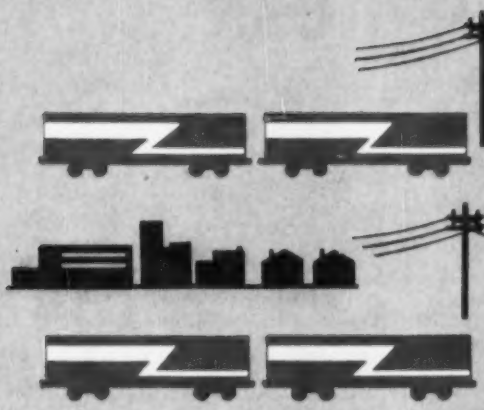
Representative electric utility companies across the country are now providing better service to customers through the use of Electro-Mobile Power. This diagram is a composite of the different jobs these units, both truck-trailer and rail, are performing. Detailed information on these applications—operating costs, KWH produced, reason for use, location, etc.—are available through your Electro-Motive representative.



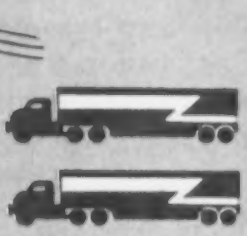
Rail units used for boosting.



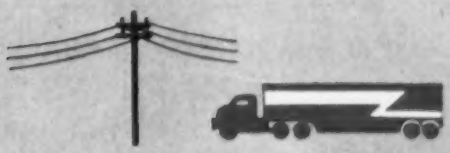
Rail units used for peaking.



Rail units used for temporary service during growth stage of new community. Units are added or subtracted until level is reached and permanent facilities can be erected in the most desirable location.



Mobile trailer units thrown into service during temporary outage caused by flood.



Mobile trailer units being used during line relocation resulting from new highway construction.


**ELECTRO-MOTIVE DIVISION**
**GENERAL MOTORS** LA GRANGE, ILLINOIS
*Sales Offices in* Chicago, New York, St. Louis, San Francisco

A MESSAGE TO AMERICAN INDUSTRY • ONE OF A SERIES

# What Research Means to American Business

**American industry plans to invest $150 billion in new plant and equipment during the next four years—more than in the five years 1952-1956. It plans to carry out this record investment even though manufacturing capacity has nearly doubled since World War II.** These facts are reported in McGraw-Hill's tenth annual survey of Business' Plans for New Plants and Equipment. They contradict many long-established theories about investment in capital goods.

According to the textbooks, a high and rising level of capital investment is generally followed by a decline. The bigger the rise—so the old theory goes—the bigger the decline will be. But, after a decade of high-level investment and an especially strong rise in the past two years, industry now has plans to keep right on with near-record outlays for plant and equipment. Does this mean some new factor has been added, to change the investment cycle?

## The New Factor—Research

**The latest McGraw-Hill survey points out one new factor which, more than any other, is changing the nature of the investment process.** This is the record outlay planned by U.S. corporations for **scientific research and development**—to create new products and develop new industrial processes. The rapid growth of research in industry, and plans for even more remarkable growth in the years ahead, are shown by the accompanying table.

**This year industry plans to spend $7 billion on research and development—up 20% from 1956. By 1960 it will spend $9 billion—enough to create a major new industry.**

**By 1960 manufacturing industry expects sales to be up 26%—with half the increase in products that were not made in 1956.**

**Growth of Research and Development Expenditures**

**(Millions of Dollars)**

| | | | PLANNED | |
|---|---|---|---|---|
| | 1955 | 1956 | 1957 | 1960 |
| Machinery | 408 | 506 | 577 | 704 |
| Electrical Equipment | 950 | 1,149 | 1,310 | 1,637 |
| Aircraft and Parts | 1,038 | 1,558 | 2,274 | 3,161 |
| Fabricated Metal Products and Ordnance | 134 | 165 | 174 | 210 |
| Professional and Scientific Instruments | 185 | 252 | 300 | 453 |
| Chemicals | 440 | 498 | 528 | 617 |
| Paper, Rubber, Stone, Clay and Glass Products | 149 | 174 | 196 | 233 |
| Petroleum Products | 171 | 205 | 225 | 277 |
| Other Manufacturing | 1,038 | 1,279 | 1,388 | 1,557 |
| Non-manufacturing industries | 254 | 310 | 347 | 419 |
| ALL INDUSTRIES | 4,767 | 6,096 | 7,319 | 9,269 |

## What Research Is Doing

Here are some examples of how industrial research is opening up new markets, or compelling the modernization of old facilities:

New automatic controls in petroleum refining will raise the quality of gasoline and reduce the time required for production. A new process for recovering oil from depleted wells promises to multiply our potential reserves.

A new process for treating iron ore will permit the ore to be fed directly into steel furnaces—without the need for blast furnaces or coke ovens.

New turbine engines—made possible by the development of heat-resistant alloys for turbine parts—offer greatly increased power for aircraft, ships and automobiles.

**Altogether, industry plans to introduce more new products in 1957-1960 than in any previous four-year period.** It also plans new processes on a scale that will make much of our present capacity obsolete. These new products and new processes are the secret behind continuing plans for high investment.

One-third of all manufacturing firms are building new plants this year to produce new products, and by 1960 this may account for 10% to 20% of all capital expenditures. At the same time, manufacturing companies report that over half their capital expenditures in the next four years will be for modernization of equipment and introduction of new processes. Thus the preponderant share of new investment will be based on developments growing out of research.

## A New Kind of Prosperity

**The keen interest of U. S. business firms in scientific research points the way to a new kind of prosperity for our economy—a prosperity based on deliberate creativeness.** As long as we can create new products that will offer better value to consumers or cut costs to manufacturing firms, business will continue at a high level—not at fever pitch, perhaps, and it is to be hoped not at an inflationary pitch. But based on a steady stream of new products and processes, we can have a high level of general prosperity that defies the old laws of boom and bust.

## It's Not Automatic

Of course, there is no guarantee. New products do not spring up by magic as the medieval alchemists hoped they would. They are found as the result of long and expensive effort in laboratories and pilot plants. This effort requires an increasing number of trained scientists and engineers. In 1957 alone, manufacturing companies report they will need 7% more of these highly trained people in research and development. And by 1960, they will need an additional 15% to carry out planned research programs.

**The effort to maintain prosperity — as well as the national defense effort — will depend increasingly on this supply of scientific and technical personnel. But if we can supply the people, industry now has the plans for a research effort that will put an end to the spectre of idle plants and idle workers.**

*This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nation-wide developments. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.*

Donald C. McGraw
PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

# ELECTRA'S HUSBAND

## On Standardization

The last guest had bid his somewhat effusive good-byes and the host of the hospitality room closed the door with a sigh. Three of us were left in the room. The man from New York had been a speaker on the convention program and the other was the sales manager of my host's company.

He made probably the best suggestion of the day: "Lock the door, Jim, and let's have a nightcap while we simmer down. That was quite a mob we had in here for awhile."

I refilled the glasses and passed them to their respective owners. The host raised his in a toast: "Here's to bigger and better conventions but not any more of them. When I sold my stomach to the corporation I didn't expect that they would pickle it."

Three fervent "amens" were the response, and we all settled back content to let the conversation drift as it pleased.

"You see a lot of conventions, Hank, what did you think of this one?" asked our host.

The New Yorker squinted judiciously through his glass. "It was much better than average. As a matter of fact there were two or three really exceptionally good papers which, alone, would have been worth the price of admission."

### Too Many Nuts and Bolts

"I think it was a very good session too." This was the sales manager speaking. "But I thought that the speaker on standardization missed the boat. Too much about the nuts and bolts phases of standardization and not enough about the dollar and cents savings that it can provide."

I felt impelled to contribute to the conversation: "Standardization is not an easy subject to handle under any circumstances. The audience has an instinctive feeling that it involves a lot of hard work for a great many people. I know I've talked with quite a few users who don't act too enthusiastic over standardization suggestions because they feel they may end up with something that is not compatible with their present designs, and it would cost them money in the long run."

"Speaking of dollar and cents saving that standardization can bring to the customer," the sales manager said, "it's almost impossible to prove to the customer that he is making a very tangible monetary savings by promoting greater standardization. In these inflationary times, price raises based on increasing costs come faster than any reduction resulting from a standardization program. Standardization merely slows down the upward trend of costs, and that makes it pretty hard to show the customer where he's getting any benefits."

"Well, he can get a pretty good idea by ordering something that's nonstandard in a presently standardized line," remarked the host, looking directly at the sales manager. "My good customer up in the valley almost fell off his chair when I passed on the figures you quoted me on that bank of 5,000-kva transformers with a special impedance."

"Score one for standardization," retorted the sales manager, "and while we're on the subject we still have a long way to go on standardizing even distribution transformers and watt-hour meters. Sure, we've got the over-all dimensions standardized, but we're still a long way from getting a more concerted agreement on standard voltages."

"Isn't all this activity in the area of higher distribution voltages going to complicate that problem somewhat?" asked the New Yorker.

"It certainly is," replied the sales manager, "and that's going to require a lot of hard work and study or else we're going to lose much of the benefits that we have already gained. But I was particularly referring to just the run of the mind, common every day unit. With these new higher primary voltage there seems to be a demand for primaries all the way from 12 kva all the way up to 14.6 kva. Sure they all fit into the same standard case, but that doesn't help the manufacturing problem nor does it reduce the expenses of stocking a lot of different variations of what is nominally the same rating of transformer."

"Someone told me the voltage problem is also present, perhaps not to such a degree, in the rating of three-phase, four-wire watt-hour meters too," I said, "maybe there's a little work to be done in that area also."

### There's Work Ahead

"There's work to be done everywhere on standardization if the industry is going to continue to keep electricity the cheapest item in the family budget." Our New York friend settled back and continued: "We've just about used up all of the fat we had in continuously and progressively reducing the production costs of the kilowatt-hour. From now on the battle with inflationary costs is going to be won penny by penny and wholesale standardization, if it could be accomplished, would go a long way towards carrying on from where the thermal efficiency experts have to drop out."

"Selling standardization is a lot like selling religion—everyone is for it, but almost everyone has good reasons for not practicing it." This bit of philosophy came from our host. He continued with a sigh, "I suppose that you'll all say that it's again the case of the poor old salesman in the field who has to do the missionary work, although, truthfully I don't think any one of us is well enough informed on the over-all benefits of standardization to really do a convincing job."

He turned to me accusingly: "That's a job for you and all your other associates in the trade press."

"I'll guarantee to print it if you'll guarantee to read it," I challenged. "You have your sales manager put all these comments down in writing when he gets back to the office, and we'll get them in the next issue."

The sales manager put his glass down hastily, looked at his wrist watch and said: "I almost forgot I have an early plane to catch. Good night all."

# NO CORNERS
## where Rust can start

**Internal Clamping of Bushings Provides Smooth External Surface... Cuts Maintenance Costs**

Rust always gets in its destructive licks around sharp corners. To eliminate these vulnerable spots, Allis-Chalmers has developed *internal* clamping arrangements for bushings.

### New Bushings

All external hardware has been eliminated without changing the effective method of gasketing. The new two-piece low voltage bushings compress and seal the tank wall gaskets through clamping pressure applied by the bushing studs. High voltage cover bushings are held internally by a keeper plate and spring arrangement.

Reducing your maintenance and upkeep costs is a continuous project at Allis-Chalmers. Get the complete story from your Allis-Chalmers representative or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

**ALLIS-CHALMERS**

A-5327

**POWER TRANSFORMER** design time is greatly reduced. Example: certain reactance characteristics—formerly requiring 60 engineering man-hours to figure—are now computed in 57 seconds. L. Wetherill and P. A. Abetti check calculations of IBM 705 at G.E.'s Power Transformer Department.

**BOILER FEED PUMP MOTOR** electrical characteristics are computed in 5 minutes. This time-saving not only speeds but also improves motor design. W. J. Martiny, Jr. and D. H. Ware discuss operation of IBM 650 at General Electric's Medium A-C Motor and Generator Dept.

**HYDRO-GENERATORS** give optimum performance because use of computer allows time to consider many more designs than possible with old calculating methods. Mary Parillo and L. Wuosmaa complete generator design at Large Motor and Generator Dept.

**STEAM TURBINE-GENERATOR** design problems, some previously unsolvable, are solved at G.E.'s Large Steam Turbine-Generator Engineering Calculations Center. H. N. Cantrell, A. W. Rankin, and Ruth E. Callaghan examine results of turbine bucket design study.

# How computers at General Electric help speed design, shipment of improved apparatus for utilities

## Newest computer achieves faster design of power transformers

A new IBM 705 electronic computer, capable of producing design calculations up to 3800 times faster than hand methods, is now operating at General Electric's Power Transformer Department, Pittsfield, Mass. It is the latest example of General Electric's use of computers not only to free valuable engineering personnel from routine calculating, but also to help improve design and hasten shipment of apparatus for the electric utility industry.

Since this newest computer greatly reduces design time, and helps eliminate possible errors, improved transformers can be shipped faster. Also, utilities receive construction information sooner after submitting specifications, thus eliminating possible delays in building foundations.

Using earlier calculating methods, engineers had time to consider only a limited number of alternative designs. Now, all practical designs can be weighed, and the result is a transformer of optimum design for each application.

By performing in minutes calculations formerly requiring weeks, the computer reduces engineering expenses. This helps combat inflationary pressures that increase the cost of transformers. And General Electric engineers, freed from time-consuming calculations, have more time for creative thinking and product improvements.

The Power Transformer Department's machine is the newest of General Electric's growing number of computers used to hasten refinements in the Company's full range of apparatus to help utilities meet growing load. General Electric Company, Schenectady 5, N. Y. 301-356

*MORE POWER TO AMERICA*

GENERAL ELECTRIC

ELECTRICAL WEST
SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U.S.
VOL. 118, NO. 6 JUNE 1957

**Top executives of Pacific Coast Electrical Assn. comprise a panel to tell the association's largest convention about . . .**

# The Job Ahead—As We See It!

Management spoke up at the Pacific Coast Electrical Assn.'s annual convention to tell a record crowd the aspects of major problems of utility operations in an era of unprecedented growth, rising costs, heavy taxation, manpower shortages and governmental restrictions. Chief executives of eight PCEA utility companies, assembled as a panel, gave a presentation that provoked lively interest and spirited discussion.

George C. Tenney, president of the McGraw-Hill Co. of California and publisher of ELECTRICAL WEST, acted as moderator and introduced the panelists, each of whom discussed one facet of "the job ahead." He characterized the panel as "an opportunity to share with all of us some of the thinking of top management on problems that are attendant with the dynamic growth of the area comprising the PCEA. . . . Today we have a panel of progressive executives who are going to indoctrinate us on the challenges and opportunities that lie ahead in the electrical industry."

### The Presidents' Panel

**Walter T. Lucking**
*President and general manager, Arizona Public Service Co.*
**Albert Cage**
*President, California Electric Power Co.*
**Ralph B. Johnson**
*Executive vice-president, Hawaiian Electric Co. Ltd.*
**Norman R. Sutherland**
*President and general manager, Pacific Gas and Electric Co.*
**Emery D. Sherwin**
*President, San Diego Gas & Electric*
**Frank A. Tracy**
*President and general manager, Sierra Pacific Power Co.*
**Harold Quinton**
*President, Southern California Edison Co.*
**Reid Gardner**
*President, Southern Nevada Power*
Moderator: **George C. Tenney**
*President, McGraw-Hill Co. of California*

**MR. SUTHERLAND—*on Physical Growth:*** We should all be more than glad that the electric industry is a growth industry. Our growth problems are really opportunities. We think, justifiably, that we have a right to be proud of the accomplishments of our industry in the past, but we still have imposing new heights to achieve and conquer.

The peak power load of the Pacific Southwest area estimated for 1960 is about 12,000,000 kw. The capacity of the power plants, existing and planned, to serve this load is more than 15,000,000 kw.

It will have taken 80 years from the birth of the electric industry until 1960 to reach these tremendous figures. Yet we expect to duplicate them in the 10 years following 1960. Moreover, we will have to achieve this doubling despite what appears to be a continuing upward spiral of costs. This 10-year program is very likely to cost approximately $7 billion in the Pacific Southwest area.

Where are we going to get the generating capacity of this magnitude? It is likely that about 5,000,000 kw of this new generation will be hydro and about 10,000,000 steam. The amount of hydro is probably all there is remaining that can be economically developed and, under the economic conditions likely to prevail, a large amount of it can be developed only in cooperation with public agencies due to the tax burden of the privately owned companies. When power is developed in multipurpose projects as an incident to flood control, irrigation storage and other features it should be developed for peaking purposes on our investor-owned regional electric systems. It is worth most and provides the greatest financial aid to the water project when so developed. PG and E has had a history of more than a quarter of a century in cooperative developments that merge water and power requirements into projects for the greatest ultimate good for the people.

The moving targets of fuel supply and fuel costs are important factors affecting the provision of the 10,000,000 kw of steam capacity the Pacific Southwest will need in the area between 1960 and 1970. Only time will tell whether the large increase in the cost of fuel during the past few years is permanent. During the past six months alone, fuel costs have increased more than 30%. The long-range trend in the cost of conventional fuels would seem to be upward, while the cost trend of atomic fuel is believed to be down. There is a possibility that atomic stations may become economic in the mid-1960s as a combined result of technological development and changing fuel and other cost relationships with conventional plants.

Obtaining satisfactory sites for steam-operated power plants will be more difficult in the future than in the past and site costs and site preparation costs will be higher. The many requirements of a good site all pose obvious difficulties in a period of rapidly increasing pressure of population.

As system loads grow, and sites become scarcer, the sizes of individual generating units will continue to increase in order to reduce the capital and operating cost per unit of capacity. PG and E's two new units for the Pittsburg plant are rated at 325 mw, nearly double the size of the present largest unit on the system. In the next 10 years, unit sizes will increase to 450 mw and perhaps larger. The trend may be furthered by atomic energy development, which favors generating units of large size.

With increase in unit size and increased fuel costs we may expect supercritical steam pressures of 3,500 psi or higher as well as temperatures above 1,050°, with double reheat. Each step brings some improvement in fuel use. The largest single gain in heat efficiency now under consideration involves use of a combined gas turbine-steam turbine generating plant with a supercharged steam boiler. There will be increased emphasis on simplified power plant design for lower cost. We do not think our industry has reached a plateau in steam station design.

While we naturally attach great importance to generating capacity, we never forget that the power must also be brought to our customers. About half of our total utility investment is in facilities to deliver the power once it is generated. Transmission and distribution have problems of their own which will intensify in the next decade. In doubling the capacity of our transmission and distribution systems, for reasons of community relations, we must do it with a minimum increase in the size of the physical facilities. Obtaining rights-of-way for transmission lines and sites for switchyards and substations is a problem now and it will increase in the future as areas become ever more heavily populated. The solution is for us to become better salesmen. We must learn how to convince the public, planning commissions and public officials that the public interest requires construction of these facilities in order for people to enjoy the ever-expanding benefits of electricity without unnecessarily increasing the cost.

New lines, when built, must have greater circuit capacity to reduce unit costs, and the number of new lines needed. The capacity of some existing tower lines may be increased by reconductoring or by "bundling" conductors by the addition of a second conductor to each phase. As technology improves, voltages above 400 kv will be economical, especially when increased loads require transmission of power in 1,000,000-kw blocks.

One result of larger concentrations of generation and stronger transmission ties will be extremely high fault interrupting duties imposed on system protection equipment. As we duplicate our present capacity, we must build to higher capacities and at the same time replace or rebuild much of the protection equipment and facilities we now have in service. Throughout all this we must continually seek means of lowering costs.

With the tremendous growth of residential areas we are all experiencing a demand for improvement in the appearance of our overhead plant. There is increasing public interest in undergrounding of electric lines. We need to find means of convincing our customers that this is so costly that it could only result in an economic burden on them. In the interests of our customers, however, we must pay increased attention to the design of our facilities.

We also must continue to seek improvement in methods of construction. For the past several years, construction costs have been increasing about 5% a year. Increased mechanization, heavier equipment and production line techniques wherever possible will help offset rising costs.

Realization of our great opportunity for service to this growing area will require solution of all these problems, and more besides. Finding the solutions is a task that extends down through our entire organizations. Management alone cannot do this. It will call for the best efforts of the entire team, including the promising youngster we may hire tomorrow who wants to become a utility man. I have no doubt whatever that the solutions will be found. Our industry has been solving its problems with matchless success for nearly 80 years. We are certain that it will meet the challenge of future growth in the same manner!

**MR. QUINTON—*on Financing:*** Over the past decade the principal concern of the electric utilities has been one of expansion of capacity in plant facilities to meet the unparalleled increase in demand. That challenge has been met with a remarkably high degree of success—a disapppointingly high degree of success to the federal public power socialists. It is still true that the only areas of the country which have experienced power shortages are those areas that have experienced the blighting hand of federal public power and its attendant tax exemptions.

With the increased facilities of the electrical equipment manufacturers and the now approaching satisfactory reserve position of most utilities, the industry may now be able to turn for a time to more orderly expansion planning.

**NEW PRESIDENT—At the annual convention the PCEA elected George N. Hawley, vice-president and assistant to the president of Southern California Edison Co., as its leader for 1957-1958. He is shown here (right) talking with Victor Hartley, PCEA's energetic managing director**

The challenge of the next decade may very likely center on another phase, namely, financing. Though the plant expansion may be more orderly, it has been estimated that plant construction expenditures of the country's electric utilities will increase to an average of about $4 billion per year and that $2½ billion will be raised from outside sources annually (through security sales) as contrasted to an average of $2.3 billion over the past 10 years. This increase is not so large as to foreshadow any great difficulties in itself, but there are three new factors to be considered and they are by no means inconsequential.

First, over the next 10 years, a great proportion of the bonds issued by utilities of all kinds in refunding operations in the late thirties will mature and again require refunding. These issues total some $2¼ billion.

Second, in spite of the over $4 billion treasury refunding this month, some 54% of the total outstanding national debt still matures in less than one year and 77% in five years. Hanging over the market, therefore, over the next decade is also the problem of extension of maturities of the federal debt.

Third is the increasing difficulty experienced at the federal level in the management of money and credit. We are now in our fourth higher level or plateau of money costs starting with World War II, and with continued inflation those who save will increasingly demand a higher rate in dollars of declining purchasing power for the use of their savings. The record over the past year is replete with indications of this trend.

The utilities accordingly must anticipate (1) their own increased requirements, (2) their own refunding operations, (3) the competition of the attempted lengthening of the maturing federal issues, and (4) materially increased costs of money, compared with the past. In short, I believe we may anticipate a decade of capital transactions in the utility industry as a whole, greater than this or any other industry has ever experienced in a like period in our country's history.

Before going further, it should be emphasized that money costs at today's levels, and even higher levels, are not abnormal. They are high only by comparison with the controlled and managed subnormal costs of the past 20 years.

If money rates do not hold at approximately the present or even higher levels and expansion of the economy continues, as expected, it will be the result of more treasury and central bank credit management, with further stimulated inflation as an inevitable consequence. So much for the problem.

But problems in any facet of our industry have only become opportunities, and it is likely that new patterns will emerge in the use of the basic tools which fiscal management has available to it, namely, bonds, preferred and common stocks. In the financial field, utilities have developed, of necessity, more new ideas about financial policy than most other industries.

We will be guided by year-to-year conditions, of course, but planning for a minimum of two and up to five years is essential if we are to maintain the very necessary flexibility of choice without serious disturbance to the most desired capital structure in each case.

That high tax rates are having an influence and will perhaps increasingly influence our considerations seems most likely. These considerations may be reflected in a lowering of the payout rate, that is the portion of the amount available for common stock, which is paid out in dividends. I do not meant by this to forecast a decline in electric utility dividends. I believe with inflation they must continue to advance. But the increase may well represent a less than proportional increase with earnings, in terms of payout. There are several influences here which affect this problem. Obviously, the more that can be retained in the business, the less will be the amount which must be raised from new equity offerings. There are many ramifications of this subject, but logic seems indeed to be lacking in the practice of high payouts with the result that the tax-paying stockholders share their proceeds with the government and the utility must then issue more shares than would otherwise be necessary. And the government becomes the beneficiary in the resultant process of double taxation.

Stock dividends may also come into greater usage to supplement cash dividends, as it would provide a means of retaining cash while giving stockholders the benefit of a capital gains tax rate.

The tax influence on the debt position and the character of the debt of the utilities may also result in some changes. I have in mind, of course, the effect of the deductibility of interest costs for tax purposes, as contrasted to the non-deductibility of preferred dividends and earnings for common. There is a constant moral battle of sound financing vs the great advantage of the net tax cost of debt securities, and I am certainly not suggesting or advocating indiscriminate increases in the debt ratio. Such a procedure, I believe, in the long run would result in an over-all higher cost of money. But I believe it is logical that an optimum corporate structure under, say, a 38% tax rate, or lower, should at least tend to some degree to yield to a revised concept under a tax rate of 52%—as a matter of fact, in the State of California a federal and state tax rate of 53.9%.

The revised concept, if any in this regard, may reflect itself in a clearer distinction between secured and unsecured debt, that is, between bonds and debentures.

The reasonableness of this idea receives a little greater impetus because of the higher cost of both

bond and preferred stock money which we are now experiencing. When bonds were at 3%, for example, and preferreds at around 4%, the dollar difference after tax for an issue of, say, $10,000,000 was roughly $250,000. But with bonds at 4% or higher ,and preferreds at around 5%, the difference in favor of a bond issue is automatically magnified. For the same $10,000,000 it rises from $250,000 to $300,000. The appeal of a debt security, therefore, increases as money costs mount, and it would not be surprising to see more debenture sales in lieu of preferred stock offerings in the future. The tax deductibility aspect of such a change could in effect result in the retirement of the debentures from tax savings which will, I suspect, afford an additional appeal. Unfortunately, the proper utilization of serial debentures is not as yet widely available to our industry due to the continued new money requirements which we all have and the difficulties of maintaining flexibility and balance with serial maturities added to the problem.

Finally, as I have indicated, more inflation and the increased effects of inflation continue to hang over the market as the only alternative to higher money costs. There is every indication that both will prevail and the only key to that problem is greater gross revenue.

**MR. SHERWIN—*on Management Development:*** Thinking of this subject, I'm reminded of my early days when I went to work for the company, when our whole company was housed in a building with a 50x100-ft lot, a basement and two stories, ground floor and second, and all of the general operations of the company were in that one building. You couldn't work in that building if you didn't know what went on in every department of the company. We even had enough room in the basement for a downtown substation and even enough room to repair customer appliances. Now we've become larger, as all companies have, and I feel that perhaps we should hire these younger engineers and people with college backgrounds and not put them to work for two years. Just farm them out to various departments so they would learn the teamwork that's neccessary to make a utility click.

About two years ago we learned the hard way as to how we were getting along with our employees. And if any of you feel complacent about your employee relations, just hire one of these outside firms to come in and run an employee opinion poll, and you'll find out. We did.

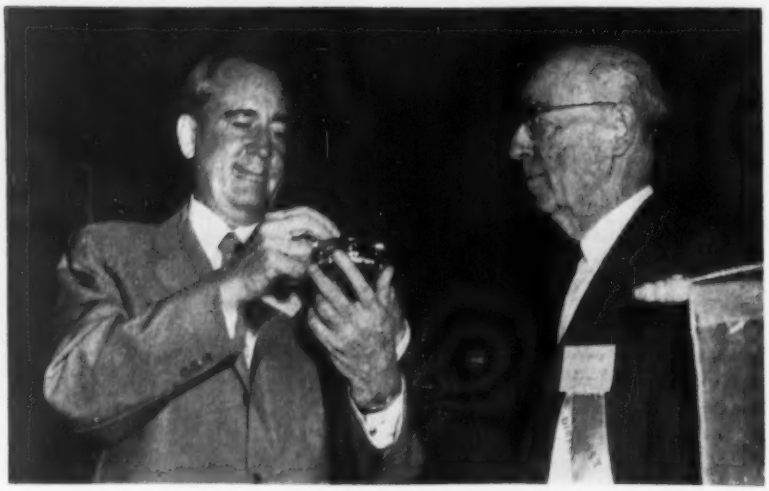
One of our weakest spots proved to be our supervisory training, particularly in the lower levels. Then, too, we found out that just because a fellow had a college degree and was really well up technically and scientifically didn't guarantee him to be a good supervisor. I don't know why except maybe he expected too much of the people under him.

To correct this situation we picked out a supervisory training program that looked good and tried it out on a "guinea pig" class noted for their absolute loyalty to the management and to the company but also of the outspoken type. Well, this super de luxe program was a lemon as far as we are concerned. We are still working on it—and we're making progress.

I think it's fundamental that all of our management people take these programs and that the first step is to get people in the lower levels to take supervisory training. It's not a one-shot deal. Once you start it you've got to keep pounding away, year after year. The best reason for this can be found in the annual report. About a year ago I was looking over our annual report and there's a page in there where we list the officers of the company and all the heads of the departments. I think there are some 68 people listed on that page. So just being curious, I said what's that page going to look like 10 years hence. Well, that's easy to do. Don't worry about the people that are killed in auto accidents, just take those that will be 65 years of age in 10 years and cross them off. Well, I crossed off and looked. Over half the names will be gone by 10 years. We have some fine people in our organization and they will develop, but they need training. Now we had an appraisal of all of our management people. We paid money to an outside firm to tell us how to do it. It was one where you list the skills that are needed in management and each supervisor rates the employee under him. Then the supervisor is supposed to call in that employee and go over the appraisal with him and tell him his strengths and weaknesses. But what happens? The boss rates the employee and then tucks the thing in the top drawer of the desk. He's too kind-hearted to discuss this with the employee; he doesn't want to hurt his feelings. It's a good system but needs a lot of push on it somewhere to get the supervisors to follow through.

A good rating system is hard to come by but it's important for another reason too. All people are not the same, even though some supervisors tend to rate them that way just to keep from hurting their feelings. Somehow it's necessary to pick people down the line who are capable of moving up in management.

Now I want an organization chart where every manager or supervisor is shown by some code number so that our top management can look



**Hawaiian Electric Stock Is Prize! The lucky winner in Electrical West's annual Load Forecasting Contest will receive $500 worth of Hawaiian Electric Co. stock. Here Edwin Vennard, EEI managing director and convention speaker, draws that company's name with help of R. G. Kenyon, vice-president, Southern California Edison Co., who chairmanned the third business session of the convention. You can still win—send in entry blank on page 205**

at it and see what people on that chart are capable of doing. Some will be rated as capable of advancing one level; some not at all; others are capable of going to the very top. Such a chart makes it easy to see if we have "backups" in all departments (which we don't have), so that managers can have understudies, someone that can take over in emergencies. If we had such a chart, we would probably find in some departments all of the people are well qualified to move up even to higher jobs; in other departments they're all stuck at the level they're in. And that's going to mean some shuffling around in our organization in the years to come, but I think we can do it.

Even after you have this system, you still have problems. Looking ahead, there's a man that retires in three or four years. We'll go over the chart and find a very well qualified employee ready to move up. Instead of keeping it secret, we more or less officially say he's the understudy and everyone knows it. But there's still the problem of making sure that the understudy is qualified when the boss retires. If you don't watch this thing the man suddenly retires and you find the understudy doesn't know a darned thing about the job. Sometimes the man that's retiring is so proud of his work he just can't let go of it and won't delegate authority to the understudy.

The trick in this case is to keep following up during the year or two prior to retirement to make sure that the understudy is being given authority and carrying on the job. One way to do that is to extend vacation periods in the late years. I'm serious about that. Maybe the year before you retire, you take a five-month vacation. That gives the understudy a chance to try his wings. And then the year just immediately preceding retirement you take maybe a six-month vacation.

There is another thing we've done a little on and I'm highly in favor of it. People capable of advancing, perhaps to any level, should be sent to the summer programs put on by universities. We started that a few years ago and we're increasing it. It should be done on a broad scale. The worst thing you can do is send one man. It puts him in the unenviable position of being the crown prince. That's something to avoid. We have sent a number of men and are going to increase our participation. It's a fine training.

I do want to mention one other thing that develops people and I think that's our own Pacific Coast Electrical Assn. When I started attending these sessions, or before I started attending PCEA meetings, I thought that San Diego had all the problems in the world and that every other company in this business had no problems at all. And I wondered how I could get to working with a company that always seemed to have problems. After I started attending these conferences and workshop meetings, you know I was darn glad to get back home to our few problems because I found every other company in this business had more and bigger problems than we have. But I do believe that that experience, not only the convention but these in-between conferences and workshop meetings, has a very broadening effect on our people and I think it's to the advantage of all of us to support it.

**MR. CAGE—*on Partnership Responsibility:*** Obviously, there are many facets to the subject of partnership responsibility, but time allows me to discuss only the subject of sharing of power generation, and that quite briefly.

Such responsibilities are indicated by the participation of various public utilities and power systems with the federal government in such projects as Hoover Dam where the payment for power over a period of 50 years repays the government the construction costs.

We are familiar with the fact that all companies are generally very willing to help out adjacent companies in case of emergencies or power shortages, and to place service to the ultimate customer as a primary objective. The idea of power pooling on a permanent contract basis is rapidly coming into vogue, particularly in the east. Responsibilities and benefits of power pooling include the sharing of reserves, the use of economy energy from the lowest cost source available, the joint use of transmission facilities, the saving in transmission line losses due to the counter flow of energy and the construction of larger units that would ordinarily be erected by an individual company.

The construction and operation of the so-called Axis plant is a development along these lines. In cooperation with our good friend and neighbor the Arizona Public Service Co., California Electric Power Co. has entered into an agreement for the construction and operation of the Yuma Axis plant, with the Imperial Irrigation District furnishing certain transmission capacity and participating in the operating cost and output.

A site has been purchased and initial installation of two 80,000-kw units is planned, with the first unit being constructed and owned by California Electric. There will be an actual dividing property line, or axis line, between the two units, California Electric owning everything on one side of the axis line, and the Arizona Public Service Co. everything on the other side. This separate ownership is primarily to satisfy the requirements of each company's mortgage indenture and to permit separate bondability. There will be some jointly owned common facilities. Some of the basic advantages are the lower unit cost of larger sized units than would normally be installed by any of the three agencies separately, the sharing of reserve capacity and early loading of new units with consequent improvement in load factors, the saving of large capital costs of transmission lines, as well as the reduction in operating cost and saving in transmission loss through the counter flow of current. Arizona Public Service Co. will operate the entire plant, with the three agencies participating in the cost.

**MR. LUCKING—*on Community Relations:*** Unlike most business organizations, a public utility company can not pull up stakes and move to a new area where business and social conditions appear to be more attractive. Consequently, the utility must do everything possible to mold the economic and social climate in its area into one that is conducive to the most efficient, effective and harmonious operation of the company in relation to the community it serves.

This, of course, is the very essence of any worth-while community relations program. But what, exactly, do we want to accomplish with such a program? What are the specific objectives? Well, there probably are as many answers to that as there are people in this room today. And the correct answers mean dollars to us as well as a pleasant atmosphere in which to work.

However, here are a few of my ideas on the major objectives of a sound community relations program. First of all, it should develop a personality for the company in relation to the communities it serves. Before people can become friendly with us or genuinely like and understand us, it is necessary for us to prove that our company is something more than a big mysterious corporate entity. We must continu-

ally find new and better ways of demonstrating that our company is made up of individuals with the same ordinary human traits that everyone else has. We must recognize that no matter how big our company is, it is made up of individual communities, which in turn are made up of small neighborhood groups. And if our company respects the dignity of the individual and honestly does something to try to better his lot in life, our corporate personality will be outstanding.

The second objective of a community relations program should be to establish such good relations with each individual community that it will favorably respond to those things you want it to respond to. I don't have to dwell on the necessity of obtaining favorable public response to such things as rate increases and franchises. But can you —can any of us in the private utility industry—really count on favorable response to the issues that crop up as a result of the private vs government power philosophy?

And like everything worth-while in this life, a good community relations program is not confined to what you get out of it—in actual fact, it depends upon what you contribute to it.

Successful community relations is predicated on the fact that the company is basically sound and honest as far as its philosophy of doing business is concerned. We as management and employees must set the example in good conduct and cooperation so that the community knows beyond a shadow of a doubt that we are sincerely interested and concerned with the welfare of the community, state and nation.

We must demonstrate this concern by our willingness and readiness to provide the amount and type of service needed by our customers, present and potential. Our rates must be fair and reasonable.

We must be unafraid to speak out in behalf of our own survival against those who would suppress and suffocate the private utility industry.

We must provide the community with all the information necessary for people to understand our operations and our problems. And let us not forget that the community is made up of many groups of people, some are customers, some employees, some stockholders, some government officials, educators and, of course, that great number so fondly referred to as the general public.

We must recognize the necessity of working together as an industry, sharing the tools and techniques of community relations as well as agreeing on the broad aspects of our community relations problems, and sharing with one another the tools and techniques we develop in our own areas of operations.

And so I believe that if we define our objectives in this matter of community relations and if we work as hard at reaching these objectives as we do at improving our load factor, we will have no need to worry. If we do these things, we will have assured ourselves of our place in the community in the social sense as well as the physical sense.

**MR. GARDNER—*on Customer Relations:*** All of us in the utility business know public opinion to be a force to be reckoned with. Selling electricity at a profit is not enough. Our customers must be satisfied with their purchase. If they are not satisfied they have no other place to go to get electrical service. This is a hazard of our business because a dissatisfied customer is forced against his will to continue to deal with us. He becomes vocal in his criticisms and adversely affects the thinking of his neighbors.

To illustrate the customer relations problems that have come from rapid growth and increased usage of electricity, I am taking the liberty of using case histories of my company.

In Las Vegas hotels, motels and casinos use large amounts of electricity. However, our average residential customer last year used 9,780 kwh, nearly four times the national average. This large average use of electricity does not tell the whole story of this problem. Some of our customers live in small apartments where space heating and cooling is furnished by landlords and the apartment usage is comparatively small. On the other hand, we have large groups of customers who have very high usage. For example, one tract of 102 medium priced all-electric homes has an average annual usage of 19,950 kwh. Twenty-five per cent of the residential bills we issued last year were for 1,000 kwh per month or more.

High usage of electricity here resulted from low electric rates. Low rates made it possible for our customers to heat their homes with electricity and to use it freely for other purposes. The low electric rates resulted from Las Vegas' location at Hoover Dam's front door and until 1954 Hoover Dam furnished all the cheap energy the area needed. Since then conditions have changed. Hoover Dam power output is down and power requirements of the area have skyrocketed. While in 1953 all of our power requirements came from Hoover Dam, in 1956 only 24% came from that cheaper source.

Despite higher power costs electric rates are still very low in southern Nevada, averaging 1.15c per kwh, less than half the national average.

From a recent public opinion survey of our territory, we were happy to find that, generally speaking, our customers thought well of us. But we were somewhat surprised to find this quotation in the survey report: "There is a little more than average criticism of the cost of electricity. . . . Most of those who complain about the cost of electricity say that their 'high' bills are due to the company's rates rather than to the amount of electricity used, and they tend to believe rates are higher locally than elsewhere?

The main point I wish to make there is that our low rates themselves were not enough to influence favorable public opinion. We knew our rates were low. You, in the utility business, know they are low. Our customers apparently were not convinced of this fact. We found that facts were ineffective unless communicated to our customers in simple terms they could readily understand.

The problem of selling low rates is not as simple as one might first think. Low electric rates cause high electric usage. High electric usage causes big electric bills even though the rates are low. A customer tends to compare the total amount of his bill for an all-electric home with the amount he paid elsewhere for lighting and a few small appliances. If we are to maintain good customer relations we must effectively sell our customers on the value of *all* the services they receive in their bill.

An electric bill in an all-electric home is not merely a lighting bill as many customers still regard it. It is a bill for lighting, cooking, food refrigeration, TV and radio entertainment, laundry and valet service, summer space cooling, winter space heating and year-round air conditioning.

The Las Vegas area has participated in the general migration of people to the West which has made the Pacific Coast area the fastest growing in our nation. There the demands for electric energy have increased at an even more rapid rate than the growth in population. During the past three years our

electric revenues have increased 123%, our electric energy sales 100% and our customers by 50%. To meet the demands of power we had to build a steam plant almost in the shadow of Hoover Dam, and make other system improvements that have increased our plant investment 355% in three years.

At the start of this three-year period, power was so short that the company had to curtail the use of electricity for space heating by the installation of load-limiting devices on the customers' premises. There was a strict ban on use of electricity for commercial space heating. Customer relations were bad.

As a result of our extensive building program and through interim purchases of large amounts of electric energy generated by steam in Arizona we have been able to lift all curtailments in the use.

The public opinion survey, mentioned above, showed that our customers knew and appreciated the many steps taken to furnish the area with an adequate supply of electricity and to improve service. Our customer relations improved with the improvement of our service.

Our customers like to deal with us if they think we are a good citizen in the communities we serve. They are interested in knowing whether we pay our fair share of taxes and support worth-while community projects. We must actively support the development of the area we serve and our rates and practices must not hamper.

In matters affecting electricity we are expected to assert real leadership. Customers expect us to help them solve their electric problems, quickly, pleasantly and without cost.

I am sure that all of us know that the active help of employees and shareholders is essential to good public relations. Management can reach only a limited number of customers personally and the printed word has limited effectiveness. A well informed and enthusiastic body of employees and stockholders located within the service area can reach and favorably influence those customers whom management can not reach.

In conclusion I want to emphasize the importance of continued work to improve our customer relations. Despite a remarkable record of accomplishment of the utility industry we have barely held our own in public esteem. While utility managers have worked hard to furnish the best possible electric service at the lowest possible rates, other interests have worked hard to limit, if not eliminate, private power. Most of these attacks have been political and most of them have failed.

Our best insurance that we can continue to serve the public is enlightened and satisfied customers brought about by a company-wide program for improved customer relations.

**MR. TRACY—*on Taxation:*** First let me assure you that I am not an expert on taxation. However, I feel that perhaps in this instance all that is needed is a general understanding, combined with a little common sense in order to reach a fairly sound and reasonable opinion.

"The job ahead" in the field of taxation is not only a management problem but is everybody's business. The impact of taxes upon us all as individuals as well as upon the businesses we represent has reached a point of near oppression. Mr. Average Citizen worked the first 130 days of 1957 for the government. After May 10 he may do whatever he wishes with the money he earns.

As to the impact on business, let us consider the effect of taxes on our business. The electric utility tax bill of this country covering federal, state and local taxes for 1956 amounted to a little less than $1 out of every $4 the utility customers paid for electric services. In many cases, the tax bite was almost twice as much as the regulated utility company saved in the form of net income and three times as much as the common stockholder received in dividends. Of course, taxes must be recovered in charges to customers, so taxes are everybody's business.

The logical question then is: What are we going to do about it? Here are some suggestions that should be given consideration.

We should remember that money invested in private enterprises goes to work. It pays dividends, creates new wealth, makes new jobs, produces profits for reinvestment and is the basis for more tax money. On the other hand, the federal government is engaged in numerous business enterprises in direct competition with private enterprises. These businesses pay few, if any, of any kind of taxes; only a few pay interest on government capital they borrow. These government-owned businesses, selling their product in competition with private enterprises, should be sold by the government and put back in the tax revenue producing field. They are now a burden on the taxpayer.

In the electric utility business alone, which is one of the groups of businesses invaded by various government bodies, it is estimated that tax collections in 1956 would have increased $360,000,000 if all suppliers of power were on an equitable basis and the government projects were paying the tax rate that private companies pay.

Many students in the field of taxation believe our present tax structure needs complete overhauling, that it is responsible for a progressive deterioration of the moral and ethical standards of an increasing number of our citizens, that it encourages moral inequities and has a tendency to make people dishonest. They recall that it is just what Karl Marx advocated over 100 years ago as one of the methods to be used to destroy our free system. Most of us will, I believe, go along with this thinking and agree that a revision of our tax structure is in order to further the development of a broad and equitable tax base which will fairly distribute the costs of government to all segments of our economy.

It becomes obvious now that the federal government has become the major problem in connection with the reductions in taxation. Economies on the state and local level are somewhat fruitless unless expenditure control can be gained on the federal level. On per capita expenditures in 1956, the federal government spent $442 per capita as compared with state's $122 and local $131. Interest alone on our national debt amounts to over $7 billion or about $42 per capita.

Regardless of political viewpoints it appears that never before has there been such wide-spread demand for steps to be taken toward economy in government. That cannot be achieved unless the government is forced to streamline its activities as recommended in the Hoover Report for greater efficiency of organization in the federal government. We should encourage similar studies for our state and local governments.

Then we have the federal aid to state and local governments as a problem. This method of spending our tax dollars not only increased federal expenditures but is specifically designed to stimulate state and local spending. The taxpayer, therefore, has two raids made upon his pocketbook. In 1957 this federal aid to state and local governments will exceed $4 billion. The prevailing attitude seems to be that federal aid is "free" and this sort of thinking must be effectively challenged. The slogan *"I'll take less from government, if government takes less*

*from me"* is a good one to follow.

Summarizing my remarks, I believe that the job ahead is the achievement of a greater tax control in order that the free enterprise system may survive. Tax control is achieved only through expenditure control. That, in turn, will be achieved only through intelligent and directed citizen interest. The taxpayer interest should be intelligent as there must be a realization of the problems facing our government as the result of defense, expanding population, rising costs and constant demands for service.

The taxpayers' interest should be well directed in order for it to become effective. Organizations that are directing all their efforts to expenditures on national, state and local levels are the various state taxpayer associations and the Tax Foundation Inc. of New York City and Washington, D. C. In planning our job ahead, we should support such organizations financially and by active participation in the work they are doing. The tax job ahead is not impossible of accomplishment. We must succeed as our free enterprise system depends upon it.

**MR. JOHNSON—*on Industry Teamwork:*** In Honolulu we use the PCEA business development program as a basis for our industry teamwork. We concentrate our efforts in two main areas. One is with the Electric Living Committee, which is used to promote all major appliances. The other is with the Certified Modern Home Wiring Committee or Housepower program, to develop the use of adequate wiring in the home.

The ultimate success of our programs has been the development of teamwork in the electrical industry to promote wide interest in both of these important areas. The end result has been a gratifying increase in equipment sales and in power consumption, always the final objective of us all. The impact of coordinated effort has been beyond all expectations.

Just before I left Honolulu, we participated in a home show sponsored by the Junior Chamber of Commerce and the National Home Builders Assn., built around the theme Live Better . . . *Electrically*.

Partners in this home show included distributors, dealers, electrical contractors, general contractors, food dealers, newspapers, banks, finance companies.

In three days 20,000 people saw the show. This is one example of a program that develops industry teamwork to produce greater sales of electrical products. In addition, we have the Parade of Homes and freezer schools. Each has its partners as listed above.

Just as on the mainland, there is a tremendous building boom in Honolulu. We tie into this boom with some very effective promotions carried out in cooperation with our two leading newspapers. Last year, one paper ran a six-week campaign on the Live Better . . . *Electrically* theme, the same kind of campaign that was waged nationally. The other paper put on the Parade of Homes, which was an exhibit of five all-electric houses. Both promotions had the full cooperation of many enterprises—in the construction, financial and electrical groups. The Hawaiian Electric Co. provided leadership coordination and advertising support. The newspapers received quite a bit of profitable advertising space. Altogether this was such a good demonstration of teamwork with such good results that similar promotions are being staged again this year.

New subdivisions are opening up all over the island. The subdivider invariably announces his opening by a series of classified ads. The PCEA in Hawaii cooperates by contributing an additional 40 in. of classified advertising in each of Honolulu's two main newspapers. This calls attention to the fact that the houses in the subdivision will be wired for complete electrical living. In subdivisions where model homes have already been constructed and appliances installed, we send our home service department ladies to demonstrate the use of the appliances and point out the value of having an all-electric home. This is teamwork between the utility, the PCEA, the subdivider, contractor and distributor.

Here's another example of assistance and cooperation. During our recent tidal wave disaster, PCEA offered to repair without cost appliances damaged by the tidal wave. This had a tremendously favorable impact upon the community. We became partners with the distributor in this case, each bearing one-half of the cost to remove the damaged appliances from the disaster area, repair them and return them to the families. In all, 197 appliances from 150 families were cared for in this instance.

We have made outdoor garden lighting popular by the use of a "loan kit" and the services of a qualified demonstrator. Hawaii, because of its favorable climate, finds its evenings conducive to outdoor living. Attractive floodlighting of a garden is enjoyed by the entire family. Use of proper floodlights and extension cables makes the installation inexpensive. The homeowner buys the kit from his neighborhood supplier, using our specifications.

The Hawaiian Electric Co., with all of this, has continued its program of newspaper, TV and radio advertising, much of it done under the PCEA signature, with the company paying the cost. As a result of this over-all program, our sales increased 26% last year.

A second phase of our program is in the area of adequate wiring. There, with the special committee known as the Certified Modern Home Wiring Committee, which is composed of representatives of electrical contractors and material supply companies, we have prepared standards for home wiring designed for better electrical living with full Housepower.

This committee also has, with the utility, developed a program of working with electrical contractors to help them sell up their wiring jobs to include a 100-amp service and entrance equipment. Any contractor making such an installation is given $15 to aid him in his selling effort. In order to do this job effectively, we were able to get 15 electrical contractors to take the Housepower Forum sales course, which taught them to sell their product and to approach their customers in an effective manner.

The results of this additional program and salesmanship course have been phenomenal. These small electrical contractors have been able to increase their business substantially because of their ability now to sell themselves to their customers and we have benefited from it, too, because now more than 40% of all new homes are 100-amp equipped.

Now, what has been the net result of all this?

First, the Hawaiian Electric Co. has seen the consumption of electricity increase from 3,000 to 4,000 kw per customer in a five-year period. Second, we have seen our consuming public demand the all-electric home to the point where 9 out of every 10 new homes are all-electric. These new homes will use from 6,000 to 7,000 kwh per year as contrasted to an average of 4,000 kwh.

These programs have succeeded because they were planned to benefit everybody involved. The utility itself considered its own interests secondary. The major point was that everybody cooperating would get something out of it, including the public we serve.

# The Challenge Ahead

**Walter J. Maytham**
President, Pacific Coast Electrical Assn.

OUR organization, the Pacific Coast Electrical Assn., can be justly proud of its past accomplishment in bringing the benefits of electricity throughout the length and breadth of this great Western empire. It has been the one place for all elements of the industry, the electrical manufacturer, the contractor, the distributor and the power company people to meet and plan their future, solve their mutual problems and to coordinate their activities to the end that everyone could enjoy the benefits and conveniences of electric service.

It has been a working association and, over the 40 years of its history, many men and women have given their time and effort to promote the teamwork and cooperation that has built the stature of PCEA to its present high place among all industry associations.

All of this means that we must be vigilant and alert to meet the challenging future that lies ahead for every one of us who is privileged to live and work in the great electrical industry of the West. I use the word "challenging" deliberately because all signs indicate that we are only on the threshold of the great electrical age of man. Predictions of the future use of electricity border almost on the fantastic. Forecasts of population growth are as startling as they are disturbing. We of the electrical industry are confronted with the great problems of growth—growth in the use of electrical energy and growth in the numbers of people and places where it will be used. If ever a challenge was flung down to a group of people, this one is the granddaddy of them all.

Our program this year gives details of the challenging tomorrow that lies ahead. From it, I am sure you will find food for much sober reflection, the inspiration that comes with opportunities unlimited, and a clear sense of the responsibilities that all of us must assume if our generation is to pass our heritage of service.

Historians probably will record the 20th century as the dawn of the electrical age. Back in 1911 George Westinghouse called it the "Age of Electricity." He used these words to describe it:

"Had a Jules Verne sought to imagine some universal servant of mankind, he would have described some magic agent which would apply nature's forces to do man's work; which could take the energy of her hidden coal, of the air or of her falling water, carry it by easy channels and cause it to give the light of a million candles, the power of a thousand men or to move great loads faster than horses could travel, to produce heat without combustion and to unlock chemical bonds and release new materials.

"No such wonder was pictured by the seers of the past; and yet a subtle force which transcends the power of the imagination is daily doing all these things. First the toy and long the mystery of scientists—electric power is now a familiar tool for the accomplishment of work, the increase of comfort and the pleasure of mankind." It's hard to improve upon those words.

We are in a century that is full of tremendous developments. We are indeed fortunate to live in these exciting times. We can't help but be aware of the increasing tempo of activity and the growing urgency to get things done.

I mention this because, startling as it may seem, there are only 83,000 working hours left in the 20th century. That's not very much time to do all the things that people tell us have to be done between now and the year 2000. The only way that can be done is by careful planning, accurate programming and coordinated effort. Those three activities are an integral part of our association work.

I turned to some of the annual messages of past presidents of PCEA for inspirational help in preparing these remarks. Believe me, I found plenty.

Most of the things that have been said in the past five or six years are as equally true today as then.

Human relations, vigilance against creeping socialism, industry teamwork, selling have been emphasized in the past and they are just as important today as they were when they were called to our attention by past leaders of this group. Now I would like to offer additional subjects to be considered in the future.

First, I'd like to talk about manpower, particularly technical manpower. All of us are in need of trained, technical manpower and we all are competing with each other for the trickle of technical graduates from our colleges and universities. Certainly the colleges and universities are not supplying the industry's demand.

Might not then a new section in the PCEA, called the manpower development section, be in order? This section to work with our educators for the long-term purpose of increasing the rate of boys that take engineering work with our colleges and universities so that more attention is paid to power, distribution and other courses that our industry needs so badly. Furthermore, this section, if formed, might spearhead in management development programs in our own companies and work with other PCEA sections in their training work.

Here's another thought that might merit investigation. It has to do with both geography and some of the common problems that confront all of us in the West, such as water development and federal power.

Let's look for a moment at our electrical industry neighbors in the great and growing Pacific Northwest and the Rocky Mountain area. For the most part, their objectives, responsibilities, philosophies and challenges are identical with our own.

In these areas—the Pacific Northwest and Rocky Mountains—there are great regional associations very similar in their constitution and operations to PCEA. Might not it be time to explore with them the greater opportunities for work and service that could come from a closer working liaison among these three industry groups?

I'm not proposing or even intimating that there should be a consolidation but I am suggesting that perhaps it would be mutually advantageous to work out regular meetings of the managing directors or possibly even the officers of the associations, at which plans could be coordinated to meet common challenges and to reach common goals.

Rethmeyer W | Pape PG and E | Larkins PG and E | Goodwin Gesco | Dickey Anaconda | Carr PG and E | Borda Okonite | Albracht W

**What's in store for PCEA?**
**Before the millennium . . .**

# 83,000 Hours of Work and Growth

Jack Corette — Today's problem is to tell give-away from a take-away

PCEA President Walter Maytham, addressing the 40th annual convention at its opening meeting, welcomed a record conference registration of more than 1,225 members. He commented on the tremendous job facing utility management and charged that there were only 83,000 working hours left in the 20th century.

Acting under the urgency of President Maytham's charge, Prof. William A. Spurr, professor of business statistics, Stanford University, discussed the forces which are responsible for the prodigious Western growth. He viewed our industry as being composed of three segments. The first segment moving toward market centers, the second segment, such as the mining and lumber industry, gravitating toward sources of supply and the third segment, a "foot-loose" form of industry which could seek out the salubrious climates. Professor Spurr indicated that the market centered industries and the foot-loose industries would in large part account for the continued growth of the West.

Doctor Spurr discussed the population increase and its effect on our economy and also the historical movement of people from east to west which can be traced across Europe to the New World and finally to this last boundary line, the Pacific Coast. Professor Spurr refrained from exotic extrapolations of existing trends. Perhaps he was more optimistic in his simple statement that there appeared to be no forces that would limit the West's further growth and development.

Under the leadership of Graham Holabird the convention took a close look at four topics closely related to the utility industry and Western growth. In his talk "Your Stake in Homebuilding" Robert Boian, manager of the Live Better . . . *Electrically* project, put it on the line. "We feel that by 1960 Live Better . . . *Electrically*, as the spearhead of the electrical industry's coordinated program, can reach these targets.

"In annual residential electricity sales, a 46% increase to $5.1 billion.

"In annual appliance, radio and television sales, a 30% increase to $11 billion.

"In annual home rewiring sales, a 190% increase to $300,000,000.

"In annual financing for home electrical modernization, a 31% increase to $6.7 billion."

He pointed also to the trend toward off-site home construction resulting from the increasing cost of on-site house construction. This fact combined with the fact that four out of five home buyers are buying ready-made homes and that a majority of these people are second time home buyers indicates that today's buyer is looking for improved living conditions. He is in no hurry and will be more selective than ever. Because of this, builders will be more interested in the electrical living features which have much to do with the salability of today's houses.

Bank of America Vice-president Earl Coke related agriculture to

| Walker | Roach | McGann | McChesney | McCarthy | Lee | Leihy |
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business in his talk "Your Stake in Agriculture." He pointed out that "once the farmer raised his own fuel and power, used fertilizer from his own farm, grew his own foods and bought only sugar and spices from the store."

"Now business supplies agriculture with 50% of needed input production items at a rate of $16 billion annually. The farmer applies these products to his land to produce farm goods he sells back to business and industry at a current annual rate of $30 billion. In turn, business and industry assemble, store, process, package and distribute these products to the public at a rate of $75 billion annually."

He pointed out that the growth in Western population and the trends in food consumption confound the argument that there is a saturation point in food production. He placed great confidence in the ability of the West's farm-business team to give the farmer new power and electronic tools which will enable him to do his job more efficiently.

Smiling that "if one makes short-term predictions he must be very accurate but that the only requirement on hundred-year predictions is that they be entertaining," Tomlinson Fort, vice-president of Westinghouse Electric Corp., discussed "The Challenge of Our Industrial Market."

Fort explained that in 1954 his company had forecast industrial power requirements in the order of 400 billion kwh in 1963. While these predictions appeared somewhat starry-eyed at the time, today's reappraisals indicate that they were conservative and that the actual usage may run 450 billion kwh in 1963. He chided that "we in the electrical industry have often said that the use of electric power is doubling every 10 years. However, since the war we have been doubling every seven years." He pointed out that this raises the question, will we soon be doubling every five years?

He concluded, "Of course, we can not for a moment assume that this industrial load will be there waiting for us in 1963. The proper approach is to forecast as well as we can, build facilities toward our forecasts, and then plan and work and sell to make the forecasts come true."

Dow Jones & Co. Chairman Robert M. Feemster charmed the group with a cold-turkey appraisal of the utility industry's promotional efforts as the "lousiest in the business community." He recited electric utility expenditures for promotion and advertising in 1937 as 2.6% of gross with a steady decline to 1.6% of gross today. Other industries, he pointed out, are spending almost twice as much per dollar of gross sales today as they spent in 1937 for advertising and promotion. He drew the group's attention to the fact that the place to raise capital is with promotion "Back Home," not on Wall Street. He indicated that utilities are going to have to start budgeting tomorrow's dollars for today's promotion and advertising if they hope to get their share of the consumer dollar.

Continuing on Friday morning with R. G. "Spike" Kenyon at the helm, the program was started by Fischer Black, publisher of *Electrical World*, with his comments on the service responsibilities in an electrical economy. In his discussion Black compared power outage stories as they appeared in his magazine with reports in the daily press.

Black pointed out that while the one-half of 1% of utility customers say that service has been unsatisfactory because of power failures it is worth-while to remember that the public does not understand or appreciate the planning and effort that goes into making electrical service trouble-free.

He indicated that more scientific analysis of outage data is needed and that this coupled with continued attention to long-range planning will enable the electric utility industry to maintain its excellent record for continuity of service.

Justus F. Craemer, prominent California newspaper publisher and long-time member of the California Public Utility Commission, in discussing the Trinity River conflict said that opponents of Trinity part-

| Aiken | Bausch | Talley | Maytham | Hartley | Christensen |
|---|---|---|---|---|---|
| PG and E | Bechtel | Calectric | W | PCEA | PG and E |

Speakers Boian and Coke above
LBE B of A

Upper left, Doug Aiken turns the chairmanship of the Business Development Section over to Clark Chamberlain. Lower left, Jim Drake takes over from Engineering and Operating Chairman Karl Bausch.

nership are "denying the economic merits of a principle proved in practice." Backing this statement up, Craemer cited payments of more than $163,000,000 made during the past 15 years by private California electric utilities to government agencies for power, and water with which to generate power. Bringing the evils of power preference to local focus, Craemer noted that only 7% of northern Californians "could derive any direct benefit whatever," from power generated at federally built Trinity River power houses, "and their tax-free power would become a burden to all the rest of the taxpayers of the entire nation."

The fair solution, Craemer urged, would be to have Trinity power sold throughout northern California over the integrated PG and E system, "at rates established by the competent regulating authority of the State of California."

In presenting his paper, "Electric Power and National Progress," Edwin A. Vennard, managing director of Edison Electric Institute, presented a most challenging and encouraging story on things that can be done to gain public acceptance and preference for the investor-owned utilities over federal power groups. Using opinion-sampling methods, Vennard showed that giving the public the true facts on one issue shifted public opinion from 52% favoring government operation of utilities to 56% favoring company operation. His further studies showing that only the uninformed favor federal power clearly cut out a job for utility public relations for years to come.

A more thorough treatment of Vennards most challenging paper will be carried in a future issue of ELECTRICAL WEST.

A very timely follow-up to Vennard's presentation was the luncheon address of J. E. Corette, president of Montana Power Co., who spoke on the subject of "The Real 'Give-Away' in America Today." Discussing the effect of the encroachment of federal power, Corrette warned that "all or nothing" government power has four dangers. First, power shortages, which he indicated have been the case in the two areas where the federal government dominates the power supply pictures, namely, the Tennessee Valley and the Pacific Northwest states of Washington and Oregon. His second point was that reduced productivity must inevitably follow power shortages since electric power is the muscle and sinew of American industry. His third point was excessive taxation, and in this area he estimated that the people of California, Nevada and Arizona have had to bear a $205,000,000 tax burden to capitalize TVA. In contrast to this, he stated that for each $100,000,000 investment in government power facilities there is a tax loss of about $5,000,000 a year—which is the amount that an investor-owned utility could pay on a similar investment in electric plant. In his final point, Corette attacked the inflationary evils of federal power. He stated that a one-point rise in the consumers price index costs Americans $2½ billion in buying power. This loss is equal to $158 billion between the years 1938 and 1952.

President Maytham's annual meeting was fast moving with section chairmen giving a fast-moving, concise statement of this year's activities. Following this came the president's report (see p 121) and election of George Hawley, vice-president, Southern California Edison Co., as next year's PCEA president. General Electric's commercial vice-president, Larry Walker, was appointed PCEA vice-president and Walter Lucking, president, Arizona Public Service, was re-elected to the post of vice-president.

Justus Craemer
Publisher

Fischer Black
EWorld

Robert Feemster
Dow, Jones

Tom Fort
W

# Abolish Preference!

**E. M. Naughton**
President, Northwest Electric Light & Power Assn.

OUR organization, the Northwest Electric Light & Power Assn., is both regional and international. Here we completely disregard state lines and our international boundary on the north in our common pursuit of progress of the electric industry.

Since NELPA is regional in character, more people from our various companies can participate in these meetings than is possible in national organizations. And therein lies the fact that each company should derive considerable benefits from these sessions because more company personnel participate. Like all such meetings, the ultimate benefit to each company depends to a large extent upon taking new ideas back home and putting them into practice.

Our organization, dedicated as it is to the welfare of the private electric industry, faces two very serious threats to our future growth and welfare. All elements of America's investor-owned electric utility industry are agreed that the future of the industry, as we know it, will be determined by how successfully the American people are given the facts concerning two matters of overriding importance: *power marketing preference and tax inequality*. These twin instruments of the law, as they pertain to the marketing of government electric power, are patently unjust and unfair to four-fifths of the public.

People are waking up to the fact that 80% of the users of electric power in America—those served by the investor-owned industry—are the victims of discrimination in favor of a small privileged class served by government-subsidized power agencies. The biggest job of the utility industry is to get more and more people to realize the magnitude of these inequities and to take appropriate steps to eliminate them.

Since this is our biggest job, it will take the teamwork of all of the electric utility family; that includes employees, wives, sons, daughters, stockholders and finally customers. The problem will be on the high road to solution when people all over the country realize that:

1. There is no justification for discrimination by the preference clause among American citizens.

2. Power consumers in public power distribution areas should contribute to the support of the federal government through taxes on their power business, just as the customers of the investor-owned companies do.

Under much existing legislation, preference in the sale of government-produced power is given to the electric systems of cooperatives, municipalities and other groups that pay no state or federal income taxes, nor operate under the regulations that apply to investor-owned electric companies like ours. These preference laws discriminate against customers of investor-owned electric companies when it comes to buying electricity produced at a federal project. They pay taxes like everybody else—some of which are for people in the "preferred power class."

Preference today has become a tool to get more and more money to build more and bigger federal power plants and to build political transmission lines to carry the power to more preference customers. Some people would have the federal government get into the nuclear power business and build a string of nuclear projects, electricity from which also would be marketed on a preference basis.

Customers of our investor-owned companies should bear in mind that their taxes would pay for those plants and their taxes would pay a good part of the electric bills of the people who use the power generated at those plants. They, themselves, would have no chance to buy any of this government-produced nuclear electricity until, and unless, every tax-subsidized electric consumer in the area had had his fill.

### It Grows and Grows

Federal power has grown from less than 1% of the nation's total in 1933, prior to the birth of TVA, to 15% today. In 1946, preference customers took 38% and privately owned utilities 33% of the salable federal power. In 1953 preference customers received 52% and investor-owned utilities 18% of the salable federal power.

One result of preference discrimination is the gravitation of industry and population into preference areas, widening the scope of discrimination and inhibiting growth of other areas. This practice creates a "perpetual power shortage" in the subsidized areas and raises a continual demand for more and more public power facilities. Thus public power snowballs far beyond the original intent of the project.

Americans basically like fair play. Some of the things that we can work for to promote a fairer federal power policy are:

1. No federal agency should finance projects whose primary purpose is to sell power.

2. Development of hydro power at the federal dam should be left to local agencies.

3. Local agencies should handle the transmission of power from government dams to consumer.

4. The discriminating preference clause should be eliminated from federal laws.

5. The power phases of federal projects should pay for themselves, at rates which take into consideration all of the items of cost, including taxes and interest.

6. And, finally, all federal power projects should report annually to Congress, using a uniform system of accounting.

It is important to remember that *the price we pay for public power must also be measured by the advance of socialism in our midst and our concurrent loss of liberty.*

We all have a duty to present these problems, which affect us either directly or indirectly, to our friends and neighbors to the best of our ability. We must do this more vigorously. If we work at it, we can preserve and hand down to future generations of Americans the cherished rights we have inherited from those who were willing to speak whenever a free society and a free people needed defenders.

SUN VALLEY — New ideas, fun and hard work as NELPA gears up for a more active part in the Northwest

**NELPA companies' challenge for '57-58 . . .**

# Net Income Improvement

B. C. ELECTRIC'S John Steede looked out on a capacity crowd as he called the enthusiastic Sun Valley group to order. The NELPA E and O, combined with Personnel, Safety and Purchasing, had a combined registration of 560. The feeling that something was about to happen was short lived.

John Kimball made it happen.

### Welcome to What?

In presenting the welcome address, the Idaho Power vice-president stated he was welcoming the group to a chance to grapple with the Northwest utilities prime problem—net income improvement. This, he maintained, was all important if the NELPA members hoped to fulfill their obligation to their customers, employees, shareowners and the communities at large.

He urged the job be undertaken in a spirit of cooperation—"with no one person or group in the saddle." He said that, in attaining the necessary close cost control, to be careful not to rob the industry of the chance to realize the enlarging opportunities of the future. Instead, imagination should be used liberally—to look beyond today's problems to 1966 with 1.1 trillion kwh production and even 1976 with 2.6 trillion kwh. Kimball's talk gave true meaning and purpose to the meeting.

NELPA President E. M. Naughton, also president of Utah Power & Light Co., sobered the group with his thoughtful discussion of "preference."

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In a few words, Krieg indicated his desire to have NELPA play a

bigger role in the Northwest. Words were hardly necessary, Krieg had brought about a top association meeting, by anyone's standards.

## Power Production

*Glenn Hall, Chairman*

The power production committee began with a paper by Woodward Governor Co.'s C. L. Avery and N. G. Dennis, covering the application of hydraulic turbine governors and control system to present-day power systems.

Reviewing the applications of the gas turbine since its first central station application in 1949, the General Electric's Phil Light posed the gas turbine as a natural answer to the Northwest's problem of gaining low-cost peaking capacity. These same machines would also firm the hydro capacity against low water years or unforeseen outages. In reviewing the various cycles available, he pointed out that the gas turbine can be installed for approximately $125 per kilowatt. Also, since the capability of the machine increases as the temperature decreases, its cost per kilowatt at 0 F (when many of the Northwest's power companies are peaking) is about $90 per kilowatt. With natural gas now available in the Northwest as a supply fuel, Light urged Northwestern utilities to take a careful look at these equipments.

D. C. Stevens, representative of the Rocky Mountain Nuclear Power Study Group, in reviewing the present state of the power reactor art, pointed out that the installation of power reactors will come first in areas where nuclear power will be financially competitive.

In discussing the reason for actual reactor costs overshooting estimates, he pointed out that this is understandable because complete designs and completed development have not been accomplished. Following the first generation of reactors, there will be less research and development levied against the units. Subsequent improvements in manufacturing will begin to decrease costs.

In a discussion session, J. V. Kresser of Westinghouse Electric Corp. discussed the state of the art in so far as excitation systems are concerned. He stated, "The modern regulator will allow power system operators to better control system voltages and improve the dispatch of reactive power for better system economy."

Pelton's G. V. Arata talked on 100-hp water motors and Cal Pacific's O. D. Lanning described his company's program of making a small hydro plant semiautomatic, using ingenuity and saving dollars. His paper leaves the group with four challenging questions: (1) Is there a swing toward construction of small hydro plants; (2) do these smaller plants lend themselves to the simple induction generator, outdoor construction and semiautomatic control; (3) would the low-cost system described be satisfactory to make these future plants semiautomatic; and as always; (4) are there still better ways of doing the job?

The section was concluded with J. L. Kuelthau, Allis-Chalmers Mfg. Co., giving the group his thoughts on high-voltage d-c testing of generators.

## Electrical Equipment

*R. A. Radford, Chairman*

The electrical equipment committee started its working session with two papers concerning the very challenging field of electronic computers. J. H. "Jim" Rogers, International Business Machines, gave a progress report on the use of computers in the electric utility industry. He stated that 250 utilities could probably justify digital machines and that more than 50 machines are either installed or on order. In reviewing the types of engineering problems that have been tackled with computers, he cited a load study involving 250 buses and 400 lines.

Turning from discussions of large relatively expensive digital machines, General Electric's Paul Morse pointed to an advantage of the analogue-type computer and stated that "the operator's ability to keep in touch with the system during the solution of the problem would make it a favorite with engineers."

Morse, in discussing his desk-top computer nicknamed MANIAC, said that the machine will operate at 10-kc frequency to reduce component size and cost. The machine is capable of providing four generators, 15 buses, 40 impedance units, 12 capacitor units and four voltage back or boost units.

A progress report on transformer and circuit breaker bushing standardization was presented by R. E. "Bob" Willis, General Electric Co. He stated that the bulk of the electrical and dimensional standardization on bushings through 196 kv were nearing completion. He reported that in parallel with the work of the ASA section committee, the AIEE dielectric test subcommittee was reviewing AIEE standard No. 21 covering apparatus bushings and test code for apparatus bushings.

JOHN KIMBALL—Welcome to what?

N. E. "Gene" Dillow, General Electric Co., presented a paper discussing the evolution of gas which may occur in a gas-sealed transformer under temperature cycling conditions. His paper indicated that the released gas bubbles reduced the dielectric strength of the oil which represents an undesirable service condition.

By limiting the maximum pressure range in a gas-sealed transformer or by use of conservator type of preservation this hazard can be eliminated.

"Just because there is a fuse on a substation structure, the system and equipment is not always protected." These comments by L. S. Horton, California Oregon Power Co., prefaced the discussion which covered the difficulties which Horton's company had experienced in fusing at 69 kv. Horton reported on tests which his company had undertaken in the area of high-voltage fusing.

Westinghouse Electric's R. C. Boyd discussed the new Westinghouse 115-kv, 1,000-mva, five-cycle breaker which uses sulphur hexi-

OUSLEY — It says push the button

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A progress report on transformer and circuit breaker bushing standardization was presented by R. E. "Bob" Willis, General Electric Co. He stated that the bulk of the electrical and dimensional standardization on bushings through 196 kv were nearing completion. He reported that in parallel with the work of the ASA section committee, the AIEE dielectric test subcommittee was reviewing AIEE standard No. 21 covering apparatus bushings and test code for apparatus bushings.

JOHN KIMBALL—Welcome to what?

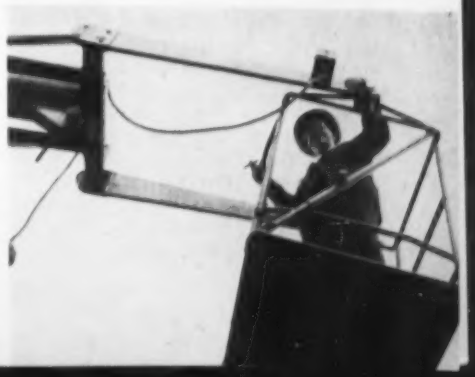
N. E. "Gene" Dillow, General Electric Co., presented a paper discussing the evolution of gas which may occur in a gas-sealed transformer under temperature cycling conditions. His paper indicated that the released gas bubbles reduced the dielectric strength of the oil which represents an undesirable service condition.

By limiting the maximum pressure range in a gas-sealed transformer or by use of conservator type of preservation this hazard can be eliminated.

"Just because there is a fuse on a substation structure, the system and equipment is not always protected." These comments by L. S. Horton, California Oregon Power Co., prefaced the discussion which covered the difficulties which Horton's company had experienced in fusing at 69 kv. Horton reported on tests which his company had undertaken in the area of high-voltage fusing.

Westinghouse Electric's R. C. Boyd discussed the new Westinghouse 115-kv, 1,000-mva, five-cycle breaker which uses sulphur hexi-

OUSLEY — It says push the button



MANIAC and friends—

| Willis | Rogers | Morse | Radford |
|---|---|---|---|
| G-E | IBM | G-E | Copco |

fluoride ($SF_6$) rather than air or oil. In discussing this light duty high-voltage breaker Boyd pointed out that $SF_6$ has a dielectric strength of two to three times that of air but possessses arc quenching ability 200 to 300 times that of air.

Hank Schwager, Schwager-Wood Corp., commented on the 19 vacuum switches which his company has installed at voltages from 7.5 to 151 kv. Among the "natural" applications for the vacuum switch is the underground switching of capacitor banks and the parallel switching of high-voltage capacitor banks.

## Transmission & Distribution

*E. P. Kelly, Chairman*

The use of series capacitors is a worth-while if somewhat neglected approach to many of the problems of transmission and distribution, declared A. R. Milliken, Electric Utilities Co. He pointed out that the ground work of theory and experiment has been laid for series capacitors use. What is needed is data for application of these devices under specific service conditions. His paper points out that two means are available for reducing the effect of series reactance, namely, raising the voltage and use of series capacitors. Over the years, the trend toward higher voltages is clearly recognizable, whereas series capacitor applications are somewhat infrequent.

Pointing out that his company had used aerial photographs prior to 1950 for the laying out of preliminary lines, L. H. J. Cook, B. C. Engineering Co. Ltd., described the improved techniques that enabled his company to reduce surveying costs through the use of photogrammetry. His paper describing these techniques covers the mapping of the 345-kv line from Wahleach to Ingledow terminal station.

He concluded that "the time is still far distant when the survey party can be completely eliminated by photographic mapping. But the use of the survey party in the field can be made far more efficient by intelligent application of photographic mapping and the maximum automation of auxiliary operations."

Earl Baughn, Washington Water Power Co., opened the discussion on estimation methods that brought widely varied opinions as to what an estimator is. The estimating job from company to company seemed to vary from high-grade clerk for routine distribution jobs to a professional engineer in situations where more dollars were at stake. Bill Braun reported on his company's use of IBM equipment for distribution estimating.

A. G. "Al" Blair, Idaho Power Co., challenged the group with the fact that in recent years no major break-throughs in speed have been realized in the construction of transmission lines. On the other hand, there has been a steady increase, probably resulting from the use of newer tools and equipments. He mentioned that hole digging was still one of the most difficult jobs in line construction and described a method of blasting holes in solid rock, using sequential charges.

Frank Wollaston, B. C. Electric Co., stated that his company was trying four gin poles instead of one during steel tower erection to better use the men on the towers.

J. V. Jann, presenting a paper prepared by A. A. Gavin, covered Portland General Electric's pole inspection and treatment program. After some years of study they have set their future plans for inspection and treatment of poles as follows:

1. Inspect and treat cedar poles after eight years of service.
2. Complete above-ground line treatment of transmission lines and then selected distribution lines.
3. Reinspection and retreatment, depending upon the condition of the poles above the ground line, and the shape of the crossarms and hardware.

## Utilization

*C. S. Alger, Chairman*

W. C. Allen, Westinghouse, presented two films which showed the impact of a growing population and its ever-increasing appetite for goods and materials on our manufacturing industries. Continuous processing, or automation, with its attendant increase in use of kilowatt-hours per worker is the only way to meet these demands, Allen asserted. Contrary to popular belief, automation upgrades the worker's role from that of laborer to technician. The end result is a higher standard of living for everyone.

Even though gas rates may be cheaper for some uses, electricity has inherent advantages that will keep it dominant in home and commercial uses if it is sold continuously and intelligently. This was the contention of O. J. Horrum, Montana Power Co., who presented his views on the impact that the introduction of natural gas will have on the Northwest. Horrum stated that the need to vent gas appliances as a safety measure oftentimes tips the scale in favor of electricity. When these common-sense ordinances exist, it will be very difficult for gas to replace electricity in existing installations.

L. G. Fanning, Washington Water Power Co., came to grips with a perennial problem facing distribution

engineers, namely, that of sizing and loading residential distribution transformers. Fanning assessed the short-time overload capabilities and the low ambient overload capabilities of distribution transformers and determined that for his system transformers rated 60% of peak would be adequate.

Since this represents only capacity to handle today's load the problem then becomes one of what size transformer to install, to last how long. Fanning's approach to this problem is to install extra transformer capacity to the point where the carrying charges on the additional transformer investment equals the cost of changing out the transformer. A comment from the floor indicated that liberal transformer sizing was justified in view of the ever-increasing prices of all electrical equipment.

R. R. Steinke, Portland General Electric Co., reviewing PGE's statistics on TV complaints, discussed 738 complaints, 28% of which involved television. Of this 208 (28%), 50% involved low voltage, 22% high voltage and 28% interference. On investigation it was found that 36% of the low-voltage complaints and 32% of the high-voltage complaints were justified. Data were not available on the number of justified interference complaints. Summarizing his company's experience, Steinke concluded that television complaints are on the decline because people have become educated to the service requirements of television and the servicemen themselves are more capable.

Bill Clements, Jr., Utah Power & Light Co., pointed out that utilities have an ever-increasing investment in highway strip lighting installations, and that this investment is likely to increase as the $30 billion highway program gains momentum. Drawing on his experience in studying series vs multiple installations, he concluded that there is no hard and fast rule. Engineering study of each system will be justified by the savings involved in selecting the proper system.

C. S. "Clare" Alger, Puget Sound Power & Light Co., opened a discussion on present-day load survey equipment which would enable utilities to do a better job of determining the load characteristics of their customers. As an example of the limitations of graphic meters, he cited a Puget Sound study covering 100 customers which required 2,300,000 individual readings from graphic charts or 700 operator days to convert these data to IBM cards for processing. He set forth the ideal requirements for such a device and turned the meeting over to manufacturers to describe their equipment. A lively discussion and question period indicated that the distribution engineers present felt that this would be a very worth-while tool.

**Emery** Idaho | **Kimball** Idaho | **Steede** BCE | **Naughton** Utah | **Krieg** NELPA

## Meters, Codes, Services

*Lloyd Janz, Chairman*

Talking about the relative merits in economics of 100-amp vs 200-amp class single-phase meters for domestic service, B. C. Electric's N. S. Clark explained the new Canadian standard rating for the American 15-amp nominal (100-amp class) meter is a name-plate showing current range of .75 amp to 100 amp. He further pointed out that these current limits have a direct bearing on test points and required performance. He discussed some load tests which show an improvement in customers' load factor as consumption increased but he indicated there was a need for more testing under actual load conditions before an individual utility could determine whether a 100-amp or 200-amp class meter would best serve over the normal 30-year life of a meter.

Utah Power & Light's F. O. Wald discussed his company's practice of metering on low voltage for high-voltage billing. After describing the methods his company has used for some years to adjust low-voltage power figures to include transformer losses, he discussed the use of a transformer loss compensator, a device that "fools the meter" by passing a current equivalent to the iron loss through a current coil of the watt-hour meter and by using a line drop compensator principle to add the copper loss increment to the registration of the watt-hour meter.

Using this low-voltage billing with the transformer loss compensator, a net saving of $310,000 could be made on 150 installations if metered at 7.2 kv or lower where the primary voltage is 45 kv.

Janz, section chairman, threw out the idea that an engineer or someone with strong technical background should be groomed for the job of supervisor of the meter department. He based his contention on the fact that despite the continued standardization and trend toward standard procedures in metering operations there is always the special metering requirement in which thousands of the company's dollars may depend upon the technical ability of the meter supervisor.

C. C. "Chuck" Blecksmith, Duncan Mfg. Co., reviewed the trends toward standardization and increased current ratings in residential meters. Blecksmith contended that the trend is definitely toward a 200-amp residential meter.

**Sinclair** PP&L | **Simons** PGE | **Kennedy** Ebasco

**Hooper** Utah | **Day** Idaho | **Beardslee** Montana | **Noon** PSP&L

**Woodward** PP&L | **Baker** PSP&L | **Ririe** Utah

**Wald** Utah | **Clark** BCE | **Janz** PGE

## Electronics

*J. S. Hooper, Chairman*

Discussing trends in power company communication systems, A. A. "Bert" Noon, Puget Sound Power & Light, traced the development of utility company communications through the development of the multiple-channel microwave systems currently in use. In a tabulation, he compared microwave with wire line carrier, radio and leased facilities with the conclusion that microwave stood up well.

The group watched a visual presentation of present-day applications of industrial TV by A. B. Day, Idaho Power. Day suggested that industrial TV in connection with a microwave length would be worthwhile for telemetering and inspection service.

C. E. Beardslee, Montana Power, discussing the development of his company's microwave system, pointed out that the system grew out of the postwar shortage of communication channels. Today, the system constitutes 48 voice channels in a total system covering 540 r-f miles. Installed costs per channel mile is about $100. Beardslee reported that even to a communications man the quality of the reception has been exceptional and this has created a favorable acceptance throughout the company. In addition to voice channels, the system handles telemetering and load control functions with the possibility of taking on relaying at a future date.

The group listened to M. D. Liechty, Leeds & Northrup Co., present a paper covering the need for economic control of generating units. His paper described the system for incremental loading of various generating units. He showed slides of existing installations. He concluded that the automatic computer control systems, which are a reality today for the economic loading of thermal and combined thermal and hydro systems, will soon become a reality for the all-hydro system.

## House Heating

*R. E. Sinclair, Chairman*

In his talk, "The Heat's On—Electrically," Mel G. Kennedy of Ebasco Services Inc. pinpointed five reasons why more attention will be given to electric heating in the years ahead.

1. The change from winter to summer peak makes electric heating a valuable load factor improvement tool.

2. Unless utilities promote electric heating, gas poses a serious threat to cooking, water heating and other appliance applications.

3. With a minimum of promotion in the past, public acceptance of electric heating is high.

4. Recent surveys indicate that electric heating is no where near as costly as many expect.

5. Heavy residential heating loads will prove valuable in the utility drive for load growth and greater efficiency.

For these reasons, he recommended that utilities be prepared for the growing electric heating load.

John D. Simons, Portland General Electric Co., reported on the joint study between his company and the General Electric Co. in testing air-to-air residential packaged heat pump units. His conclusion was that with nearly an equivalent demand and considerably less energy consumed, the heat pump which operates at the low end of the rate scale would be quite unattractive in areas where there was not sufficient summer cooling requirement to improve the annual load factor.

Encouraging participants to be realistic about their estimates of the kilowatt-hour requirements for house heating, H. U. "Bud" Wright, Washington Water Power Co., pointed out the fact that both NEMA and FHA use between 17½ and 18½ hours per day respectively rather than 24 to arrive at kilowatt-hour figures, which more nearly agree with actual experience.

Wright reported that gas company estimates in his service area are that they will take 95% of all new house heating load and 50% of all new water heating loads. With this kind of competition, unrealistic estimates may scare customers for house heating away from electricity.

The effect of residential space heating on distribution and transmission systems was well covered by R. E. Sinclair, Pacific Power & Light Co. He pointed out "that the electric method for heating houses is creating a new pattern of loading for the transmission and distribution facilities of serving agencies. The adequate design of these facilities will cause low-voltage conditions and overloaded transformers, while overdesigned will be uneconomic."

Included with the paper is a series of curves for estimating the demand in terms of temperature and the diversity that would exist with various numbers of houses. He emphasized that demand following an outage would increase sharply with time.

Shevalier, Montana Power, makes a point with Piper, WWP, and Pritchett, CPU

**NELPA personnel and safety heads plan for . . .**

# Better Utility Jobs

PORTLAND GE's Wally Gordon, chairman of the Personnel and Safety Section, introduced Joe Rittenhouse, technical director for Josleyn Mfg. & Supply Co., who brought his experience to bear on the subject of "Engineering Education and the Shortage of Engineers."

In a side splitting – as well as thought provoking – talk, Rittenhouse waded into the fundamentals that he felt are creating the shortage of engineers. They are:

1. The boondoggling methodologists who have infiltrated into our secondary schools with high-sounding philosophies about how to teach nothing.

2. Faced with poorer material in the freshman class, college deans are raising standards—making a religion of the partial differential.

3. The situation is further aggravated by academic evaluation of college instructors, which evaluates degrees and technical papers but not ability as a teacher.

Olin H. Ririe, Utah Power & Light Co., presented a scholarly treatise on the pros and cons of long-term labor contracts in the electric utility industry. His work will be a reference bit in the files of personnel directors for years to come.

In view of the obvious advantages of contracts that avoid the guaranteed annual argument, he warned that too much dependence should not be placed on long-term agreements as a panacea.

Walter O. Woodward, Pacific Power & Light Co., quarterbacked a discussion that compared union medical plans vs company medical plans, as well as service-type medical plans and insured plans.

Idaho Power's R. E. Mason and B. C. Electric's M. H. Fox co-sponsored a full forenoon discussion on fringe benefits, pay roll and job classifications. The study and work that went into the preparation of the paper was recognized by all hands. One personnel director commented that this session alone would have made the convention worthwhile. Morley Fox discussed the relative merits of wage bargaining on a "package basis" as opposed to item-by-item bargaining.

Peter Piper, Washington Water Power's dean of contract provisos, brought the group up to date on interpretations of the contracts currently in force in the Northwest.

Bob Sessions of Idaho Power directed a round table on utility employee training programs, which would ultimately promote greater safety, better supervision, and greater output.

There was strong feeling that more good training programs will be needed to attract and keep the caliber of employee that the utility companies need.

Wally Gordon of Portland General Electric and Dix Shevalier of Montana Power zeroed in on the much talked about problem of attracting and retaining engineering graduates. Figures presented at the meeting showed that utility company pay and advancement are not comparable with some of the glamour industries. It was generally agreed that the technical character of the utility industry required the best engineering skills. The group felt that programs should be initiated to re-evaluate starting pay, as well as the compensation for senior engineers.

Rittenhouse — the prof boondoggled

## Safety

*J. T. Bradshaw, Co-chairman*

Roy Elfstrom of BCE started the program with a statistical evaluation of the accident performance of Northwestern utilities. Figures indicate a marked decrease in the disabling accidents per million manhours but with some increase in the severity.

Washington Water Power's Herbert Yates and other participating companies presented reports of the success their companies have had in the use of incentives as an accident-prevention tool. The general feeling seems to be that incentives are a worth-while tool and are getting results.

A. I. Sawyer, Idaho Power Co., highlighted the fact that with high currents and ground impedance dangerous voltages may exist on ground wires. These can be eliminated only with the use of grounding mats around the poles when men are working in the vicinity. Line clearance practices on the Portland GE system were described by R. G. Summers. Mobile communication equipments were lauded for the part they play in clarifying orders.

Some of the group winced as R. R. Blantz of Portland GE showed color slides of the conditions under which serious and fatal accidents occurred as well as some of the consequences.

Panelists, left to right
Scott, Idaho Power
Kingsbury, Ohio Brass
Cady, Maydwell & Hartzell
Miksch, Pacific Power & Light
Swoisch, Pa. Transformer
Houck, Kaiser Aluminum

**Northwest peddlers and purchasers debate . . .**

# Published Prices—To Be or Not to Be

Without question, the highlight of the purchasing and stores committee activity proved to be a panel discussion of the challenging subject "Should Manufacturers Abandon Published Prices?" As Fred Hodge of Portland GE, purchasing committee chairman, smiled, "Some of the biggest names in selling in the Northwest have declined my invitation."

In a more serious vein, Hodge introduced Brodie Leihy, editor of Electrical West. Talking about the area he covers, Leihy reported that today it is difficult to find a pessimistic economist. All of the optimism that economists see nationally are "doubled in spades" for the West, which is seeing growth at 2½ times the national rate. He cited the high level of public and private spending as proof that, in spite of minor setbacks, the economy was still booming.

The bright look Leihy gave of the future added zest to the panel on published prices.

The purchasing viewpoint was supported by Tom Miksch from Pacific Power & Light and Nathan Scott of Idaho Power.

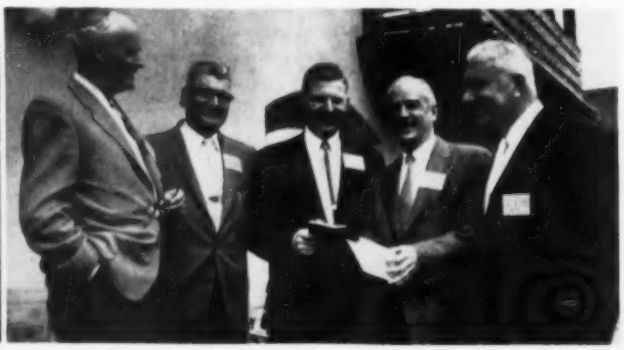
Among the manufacturers who failed to invoke the Fifth Amendment were Manufacturer's Representative Claude Kingsbury, district manager, Ohio Brass, Seattle; Dean Cady, vice-president of Maydwell & Hartzell, San Francisco; Gillette Houck, conductor sales manager of Kaiser Aluminum & Chemical Sales Co.; and Ray Swoish, sales manager, Pennsylvania Transformer Co., Canonsburg, Pa.

The purchasing agents held the opinion that published prices could not truly represent conditions marketwise and they might perpetuate the weaker elements of the economy as well as foreign competition. Suppliers, on the other hand, pointed out that published prices fill a definite economic need by moderating violent fluctuation of prices during periods of surplus or scarcity. A further advantage of published prices is that they encourage a price structure that permits adequate research and development. On one point, all were agreed; that published prices ease the mechanical burden of purchasing bread-and-butter items and, certainly they are helpful in the preparation of estimates.

In a lively, but inconclusive, question-and-answer period, price protection policies, escalation and the general relationship of responsibilities of vendor and buyer were discussed in detail. One panelist pointed out the long-range industry advantage of closer cooperation between utility purchasing and engineering departments to the end that greater standardization might be achieved.

**Milady had a ball . . .**
Kimball Hartley Falkner Jones Emery

**Next year's leaders . . .**
Steede Mortell Krieg Pritchett Miksch



# Teamwork Pays Off

**Guy W. Thomas**
President, Rocky Mountain Electrical League

THIS year's spring conference of the Rocky Mountain Electrical League in Denver can be likened to the Texas tycoon who bustled into an airline terminal and demanded a ticket. When asked where to, he replied, "Anywhere, son, I've got business all over."

For, if statistics on the region's future are reliable, all segments of the electric industry in our Rocky Mountain region are going to have business all over. The feeling of optimism that prevailed during last year's meetings again was present. The individual utility companies represented at the conference have engaged in vast construction programs to assure adequate supplies of power to future and present customers. National and local promotions are gaining momentum, and the technical problems of generation and transmission are being met with considerable success. We have managed to keep ahead of the rapid growth of our service areas.

The opportunities provided for promotion activities during the past year have increased tremendously. While individual local campaigns have occupied a large amount of time among the utilities, dealers, distributors and other allied trades, the national promotion efforts of Housepower and Live Better . . . *Electrically* have received local impetus through extensive use of the advertising material available.

Early in 1956, the league began actively and intensely to promote a home wiring modernization activity through the organization of the "Electric Modernization Bureau." The successful launching of the Housepower program as a national effort has aided this cause tremendously. We have every confidence this program will eventually prove one of the most beneficial activities we, as an interindustry group, have undertaken. Statistics tell us that in past years, well over half of the increase in sales of energy can be attributed to increased customer usage rather than an increase in the number of actual customers. This points out the extreme importance of rewiring established homes in order to insure continued increases in use.

The closed circuit telecast, which inaugurated the second year of the Live Better . . . *Electrically* campaign, drew about 350 representatives from the various segments of the industry in the area. Backed by a solid national effort, the local offshoots of the campaign seem to be getting a foothold and showing results. The telecast itself stimulated promotionally minded dealers and distributors to further action. The knowledge that this program will be a continuing one, estimated to be somewhere between 10 and 20 years at least, should provide the industry's representatives in this area with the assurance of steady national backing for their local promotions. Several of these firms are using the Live Better . . . *Electrically* material to very good advantage.

A year-round special appliance promotion program for 1957 has already been mapped out by the league and, so far, the results have been good. The first three months of the year were devoted to a Modern Laundry promotion, concentrating on automatic washers, dryers, combination units and ironers. Using a customer participation contest, 16 pieces of modern laundry equipment, donated by different firms, were given away in the service areas of the utility members of the league. A number of valuable sales leads were obtained from entry blanks which were validated by the dealers displaying the appliances. Although the contest was carried in a Denver newspaper, entries were obtained from every section of the league's jurisdiction.

At the present time a promotion on built-ins, including ranges, refrigerators, dishwashers and disposers is in progress. Public Service Co. of Colorado has devoted a large section of its sales floor to the display of distributors' models of built-ins and reaction to it has been very satisfactory.

The remainder of the year will be devoted to four major promotions covering air conditioning, cooking and freezing, electric bedding and a Christmas season tie-in with the national Operation Snowflake promotion. All of these promotions will be carried on in addition to the continuing program of support devoted to the Housepower and Live Better . . . *Electrically* campaigns.

We have every reason to expect good results from our various campaigns, both local and national. During 1956, which was not an exceptional year, the sales of major appliances in the nation alone averaged over $142 per residential electric customer. If this figure is applied to the number of customers involved in the Rocky Mountain area, it comes to light that customers are actually spending more money for appliances to build load than we are spending for facilities to serve that load. Statistics have proved, also, that people living in this region have a higher disposable income than the national average which, in turn, should indicate higher than average appliance sales in this area.

There is, of course, one factor which in the past has made our organization successful and from all indications this factor will continue to be the foundation of our group. And that is, the cooperation of all segments of the industry that gather with us. Each has individual interests. But over and above personal gain, we realize that the common goal of the league is betterment for the entire group.

And to meet that goal we also realize that, as a body, we must keep the needs of the customer in mind. Whether we be utility men, manufacturers, distributors, dealers or contractors, we want to make our products and services so satisfactory to our customers that the past record of rapid growth will be maintained and even accelerated. We all fully realize that our customers control our destiny and only as long as we can provide them with good products and good service at a fair price and with courteous treatment and, incidentally, continue to remind them of it, can we expect to maintain a satisfactory rate of growth. The problems we discuss at gatherings such as these will help us reach a common understanding of our problems, our shortcomings and the vast opportunities ahead.

**Ray McBrian, research director of the Rio Grande RR, shows president Guy Thomas, atom powered signal lamp**

RMEL Spring Conference told . . .

# Profitable Business Everywhere

FROM trusting meter readers with a key to the house on the everyday problem level to the prophetic glimpse of new concepts in atom-powered generators, the Rocky Mountain Electrical League examined the whole scope of its field at the annual spring conference in Denver, April 21-23. And then it combined with the Rocky Mountain Chapter, Illuminating Engineering Society, for a one-day symposium on all phases of lighting for outdoor applications.

Rather than general sessions with limited time to parallel committee sessions, the league elected this year to hold only two general luncheons and devote the entire conference to the committee-workshop type of sessions.

In discussing what the Rio Grande Railroad is doing in atomic research Ray McBrian, its director of research, told the first general luncheon several significant items which may affect the electrical industry of the future. Guy W. Thomas, vice-president, Public Service Co. of Colorado, and president of RMEL, presided at this luncheon as well as guided the entire conference. By irradiating low-grade fuels, even coal, particles can be so finally broken up that they can be used for diesel engine fuel, McBrian predicted. Research into powering of locomotives with nuclear energy may take the form of small power plants along the right-of-way and the restoration of an electric catenary system, McBrian said, or it may be used in new types of linear piston engines generating electricity from the piston operating in a surrounding coil.

The second general session luncheon was addressed by Grover Kinney, president and general manager of Advertisers Distributing Service, and presided over by Neil Simpson, vice-president of RMEL and newly appointed president of Black Hills Power & Light Co., Rapid City, S. D.

Likening a product or service to a political candidate requiring votes to be elected Kinney carried through the metaphor to show the campaign of advertising needed to convince the public to "vote" for the product or service in the market place.

## Accounting

Ways to simplify and reduce the work load of accounting both for large and small companies formed the basis of the four sessions of the accounting committee under R. M. Gardner, Southern Colorado Power Co., Pueblo. C. M. Melby, Public Service Co. of Colorado, is vice-chairman.

Although not dramatic, such as sales and engineering can be, the accounting functions keep track of the lifeblood of the industry—money. Even the nuts and bolts and minor items must be kept track of. Henry Johnson and L. Vernon Hunt of Public Service Co. of Colorado described how it was done by that company. Of bi-monthly billing, H. M. Doud, assistant secretary and treasurer of Western Colorado Power Co., Montrose, figures that 75c per customer is being saved in billing and collections by this method. There has been no appreciable trouble collecting and although there are fewer jobs in the accounting department all those jobs have been upgraded. Biggest problem is loss of revenue from delayed collections an extra month.

Forms and services of the associated credit bureaus for use in collecting delinquent accounts were told by Donald H. Puffer, vice-president of the bureau in Denver. Need for prompt follow-up in collections was emphasized as "the older the account, the harder to collect."

Employees have no idea what accounting complications their social benefits and government forms make necessary in accounting. F. W. Beier, assistant secretary-treasurer, Colorado Central Power Co., Englewood, described how they have combined on a few sheets all of the pay roll tax, FICA, insurance and other

Paul De Sha, Electric Modernization Bureau, demonstrates the difference between 100- and 200-amp services

Front row: J. R. Dalsant; J. McCrea, H. P. Risley, W. Lane; back row: R. Snoberger, R. Grimm, T. C. Sullivan, H. Howe

withholdings so that the staff works from a single sheet instead of three. He also described a bi-weekly time card used for pay roll distribution and a sheet developed to compute in advance much of the necessary mathematics regarding pay roll.

The second day's session began with a description illustrated by moving pictures of work simplification through integrated data processing by various office machines. W. A. Atkins, district manager, Standard Register Co., made the presentation. It was followed by general discussion. H. A. Theander, General Electric Co., presided and told how his company uses such a system in processing its own orders between field offices and factories over teletype.

The session closed with panel discussions of some of the actual field problems regarding meter reading, estimating bills, starting new customers, shutoffs, trailer camps and customer accounting problems and public relations. This was presided over by Charles Cooke. W. J. Quinn, Cheyenne Light, Fuel & Power Co., gave a short preliminary discussion. Participating in the panel were P. G. Poole, Harold H. Rust, Harold Thurman, G. F. Vinyard and Cooke.

## Engineering

The engineering committee delved deep into many engineering and operating problems under the chairmanship of J. Y. Parce, Stearns-Roger Mfg. Co., Denver. One of the most significant presentations described the problems of fabrication, shielding and dimensioning in the production of fuel elements for nuclear reactors. J. E. O'Connell of Babcock & Wilcox presented recently declassified information concerning the fuel cycles involved in the preparation of fissionable material and the methods of processing that material in order that it may be utilized in reactors. He also described some of the difficulties involved in fabricating the breeder-type reactor.

L. M. Robertson of Public Service Co. of Colorado described the installation and the objectives of the 500-kv high-altitude corona test station that is being sponsored by his company (see EWEST, March 1957, p 94). Power coming from the western slope of the Rockies into the Denver area must cross passes 12,000 ft high. A preliminary estimate of transmission line costs for such circuits is in the order of $50,000 a mile. Studies being made at the testing station are expected to provide data that will insure maximum design economy for such circuits.

M. J. Bendekovic, Public Service Co. of Colorado, and R. J. Dougherty of Stearns-Roger Mfg. Co. told the meeting why safety is both humanitarian and economical. A good safety record is a mark of operating efficiency and it is good business because the hidden costs of accidents are many times those of the direct losses. The high accident frequency also increases compensation and insurance costs and impairs both employee morale and customer relations.

Essentials of a good safety program include management leadership, support of all supervisory employees, attractive and continuous organizational and promotional ac-

**Kronenberger** Colo. Central Power | **Person** PS of Colo. | **Emery** Research Services | **Vardaman** U of Denver

tivities, proper selection and good indoctrination of new men, the provision of proper working conditions, equipment and facilities, and continuous inspection and follow-up. The key man in the safety program is the first line supervisor and safety must be uppermost and an integral part of his operation if accidents are to be reduced.

The large-scale use of power capacitors has resulted in numerous and varied types of switching controls, according to W. M. Thatcher of Sangamo Electric Co. He described the growth of switching schemes from the original simple time switch to the present-day variations of "voltage-current compensated" and kilovar types. The manufacturers, said Thatcher, have made much progress in recent years in adapting metering devices to provide a variety of controls at a relatively low cost—compared to some of the initial designs.

Load growth in the intermountain region, coupled with the scarcity of feasible new hydro sites, indicates that much of the future power needs of that area will have to be supplied by steam. One of the first thermal plants in this program was described by E. L. Bayles of Pacific Power & Light Co. This new plant, known as the Dave Johnston station, will be built near Glenrock, Wyo. The site is near an adequate supply of Wyoming coal, which can be strip mined.

The 100-mw tandem-compound turbogenerator unit will be of the modern semioutdoor design operation at 1,450 lb, 1,000° steam with 1,000° reheat. Dave Johnston, for whom the plant is named, has been a long-time leader in the electrical industry in the intermountain area.

Larry Burt, chief engineer of the Zuni steam station of Public Service Co. of Colorado, described the new hot zeolite method of water treatment that has been in operation at that power plant. Details of the application will be published in a forthcoming issue of ELECTRICAL WEST.

Use of models as a means of expediting power plant design was described and demonstrated by Joseph A. Falcon of Fluor Corp. Ltd., Los Angeles. The technique was described in an article in ELECTRICAL WEST, July 1956, p 84.

Industry as a whole needs better relations with other members of the community to prevent the enactment of improper smoke elimination legislation. This was the statement of E. R. Johnsen, Western Precipitation Corp., Los Angeles, who described smoke abatement practices in the larger cities of the country. He pointed out that, although the effect of air pollution on animals and humans is inconclusive, it has been shown definitely to be harmful to vegetation and causes extensive losses through its corrosive effects.

He described the applications of washers, cyclones and Cottrell precipitators as they can be applied progressively to reduce the solid content of flue gases. There apparently is a growing trend to use these components in various combinations to provide optimum results. Many companies are voluntarily making the investment in smoke abatement measures in the interest of good community relations; others have found economical use for the recovered particles.

**Melby** PS of Colo. | **Kurke** | **Doud** Western Colo. Power | **Gardner** So. Colo. Power

Transmission line loading was the subject of a paper by N. R. Schultz, General Electric Co., who described the advantages of the surge impedance loading concept in calculating over-all system stability. This method of calculation also serves as a convenient base for a per-unit system in general transmission line studies. The particular

value of this method is found in the ability to evaluate transmission line performance characteristics practically independent of the voltage level.

The effects of unbalanced voltage on induction motor operation were described by J. K. Howell, Westinghouse Electric Corp. Unbalanced conditions on a distribution system may result from a variety of causes, ranging from unequal transformer ratios to unbalanced application of power factor improvement capacitors. The resultant voltages applied to the terminals of an induction motor may cause current unbalance, excessive temperature rise and other undesirable effects. If the unbalanced conditions cannot be corrected, a derating factor may have to be applied and protective devices in each phase included to minimize possible trouble.

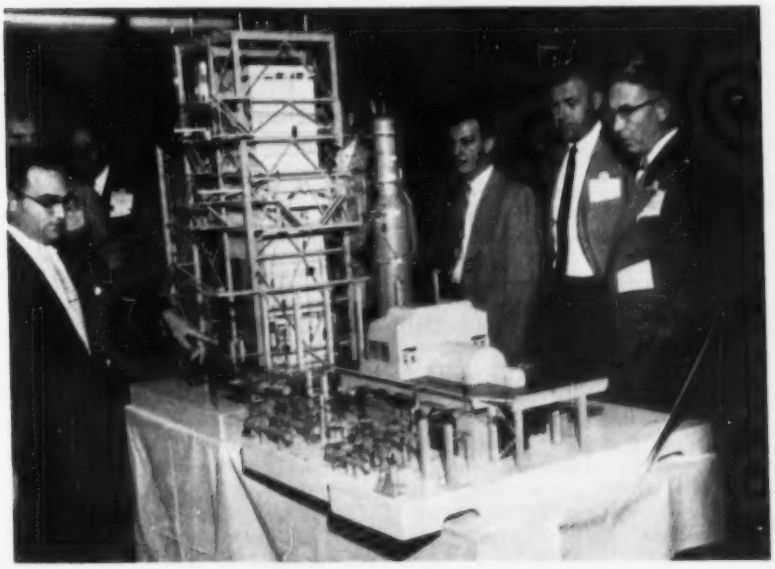
O'Connell B&W | Robertson PS of Colo. | Parce Stearns-Roger

A new system for coordinating the application of reclosers and sectionalizers was described by J. R. Hayden, J. E. Martin and R. L. Tilson of Public Service Co. of Colorado. This plan, in essence, standardizes distribution circuit protection methods on 7.6/13.2-kv Y-type distribution feeders. It works automatically to isolate laterals or distribution transformers from their main circuits and is accomplished with only four basic devices in addition to the station breaker. These devices include a single-phase sectionalizer, a single-phase recloser, a three-phase recloser equipped with ground tripping and an extra heavy duty open cutout. The plan also features the use of a single-phase "distributor" circuit, which is included on the poles in sections where numerous short laterals are taken off. Each lateral is protected by a sectionalizer and the distributor circuit itself by a single-phase recloser. Details of the installation will be described in a subsequent issue of ELECTRICAL WEST.

The application of aluminum bus conductor for power system installations was described by D. H. Sandell, staff engineer for the Aluminum Co. of America. Aluminum bus shapes are growing in popularity because of their light weight and because welding procedures have been perfected that permits easy field installations.

Engineers at the conference were taken out on an inspection trip to the Gates Rubber Co. where an industrial gas turbine and waste heat boiler combination has been operating successfully.

Joe Falcon, Fluor Corp., points out the details of a model steam station



## Information

All related to the sales function of the business, the information, adequate wiring and sales and promotion committees met jointly. First day's session was devoted to the information committee with P. J. Kronenberger Jr., Colorado Central Power, as chairman.

"A man's judgment is only as good as his knowledge," John W. Emery, president, Research Services Inc., told the group in explaining the function of field and employee research programs as a guide to setting up public information and public relations activities. Surveys reveal a lack of awareness among the public that is appalling. He told how to analyze the results—that some totals might seem to be satisfactory but because they were in the wrong groupings might be misleading. The younger group of the population is the market of the future and the older group is a declining market. Samplings are needed to measure the market as to how many people are aware, how to reach them, how to get across a message to them and

J. R. Hayden, J. E. Martin, R. L. Tilson, Public Service Co. of Colorado

Lee Jones
PS of Colo.

N. R. Schultz
G-E

J. K. Howell
W

finally how successful a program has been.

Communication between people is difficult at best, George T. Vardaman, University of Denver, said as he discussed "Tools of the Trade." Tools he discussed were employee meetings, company magazines, bulletin boards, the grapevine, letters and memos, and speakers' bureaus. In an extremely candid and uninhibited way, Vardaman debunked many of the evaluations commonly given to these methods. Most meetings, he said, are nauseating because there is nothing in them that seems worth-while to the listener. Company magazines fail because they talk too little about the employees and too much about the company. Company matters should be presented in relation to employees and their interests. The poor bulletin board, cluttered with so many notices, could be of value if it were edited and simplified every day or so to keep it fresh and interesting. Whether management likes it or not, the grapevine system is one of the most potent forms of communication. To keep it from being inaccurate, means should be found to feed it correct information and to check it for what rumors are being spread.

He concluded by taking the wind completely out of the sails of public speaking by declaring "some of the worst poor speaking is done on the higher echelons."

R. T. Person, vice-president in charge of advertising and publicity, Public Service Co. of Colorado, concluded the session. He sketched the processes by which public relations information is channeled. He gave the formula PR equals P times R as public relations depends upon the performance times the recognition. In his coverage, he included surveys to determine the viewpoints, plans for policy and programs of communication, internal and external public relations methods. The meeting concluded by a showing of a new movie, "Production 5118," in which an attempt is made to illustrate the problem of communication of ideas and ideals between management and employees.

## Adequate Wiring

A skit illustrating how to sell up a wiring job was performed by Pete Heiney, Ryall Electric Supply Co.; Roy Jussel, General Electric Supply Co., former Electric Modernization Bureau field man; and C. A. Stoakes, Public Service Co. J. L. Vanneman, General Electric Co., was chairman. He followed the skit by stimulating considerable discussion among the group present, which made it a lively session.

Paul de'Sha, Electric Modernization Bureau field representative, then demonstrated the difference between the 100- and 200-amp service entrance setups. He said that a meter, to handle up to 200 amp without current coils, is now available. The bureau is pushing the idea of having everything wall switched for added convenience. Contractors, it was said, are doing a better selling job recently since the bureau was inaugurated.

A. A. Roebke of the dealers and builders department, Public Service Co., reviewed the advertising and promotional helps, such as the Live Better . . . *Electrically* program, Housepower program, contests in the magazines, national advertising of the big manufacturers and local display materials that are now available.

## Sales & Promotion

Under John R. Dalsant, Public Service Co., as chairman, the scope of the RMEL coordinated promotion program for the year was reviewed. A successful modern laundry program and contest, recently completed, was described by C. Mallett of the *Denver Post*. Emphasis was on the whole laundry rather than on dryers as in the previous year.

The current campaign on built-in appliances was described by J. McGrea of McCollum-Law Corp., distributor. The display floor of Public Service Co. has been turned over to distributors for exhibits of built-in appliances featuring color and variety.

Although the Rocky Mountain region's climate was said to be "too good for air conditioning," Robert Grimm, G-E Supply Co., declared the same was said of refrigeration years ago.

In the absence of F. Curle of B. K. Sweeney Co., the "Cook-n-

**Carl Yarcho**
PS of Colo.

**J. L. Vanneman**
Gesco

**H. M. Doud**
Western Colo. Power

**Elmer Bayles**
PP&L

Freeze" campaign this summer was described by Dalsant. He asked for ideas for conducting cooking contests, working through chain stores, etc. H. P. Risley of the builders and dealers department, again reviewing some of the past campaigns and the Public Service Co.'s policy, told how dealers can follow up the prospects developed from these promotions and how the industry's activity is geared to develop more prospects for them.

Russ Snoberger substituted for William Pearce in discussing the market possibilities of electric bed coverings. Snoberger, G-E small appliance department, declared that now the market had reached one million units a year, two million last year, its acceptance was assured and with product improvements, colors, controls and lower prices as well as much more advertising promotion, the automatic blanket, as he said it should be called, the opportunities were tremendous. California saturation is 24%, he said, whereas the Rocky Mountain area is only 9%. He urged all distributors to get more appliance dealers back into the business as there was a good margin in it and to teach them to make use of the things the manufacturers make available with which to promote.

"Operation Snowflake" was discussed by H. Howe of the *Rocky Mountain News*. He told how the promotion, initiated by U. S. Steel last year, would be repeated again in November and December with radio and television programs and commercials to "make it a white Christmas." He discussed local participation with supporting advertising and the general advocacy of appliances as gifts.

Tom Sullivan, regional supervisor of the Live Better . . . *Electrically* project from Chicago, reviewed the program's progress during the past year. He described the "big spring push" and the materials available to tie in with it. He showed the condensed version of the nation-wide broadcast.

"Opportunities Unlimited," a film produced by *Life* magazine, was presented by William Lane, retail representative. Based on *Fortune* magazine's 1953 surveys of "the changing American market," it was brought up to date to show the opportunities in every category of business served by the electrical industry.

Final joint session of all three groups was livened by Chairman E. H. Pemberton, Southern Colorado Power Co., who used several techniques to further emphasize the things that had been brought forth in the previous meeting. First he showed a large chart of the peaks and valleys in the electrical load curve to illustrate how electric blankets could fill the all-night valley. "Why we could even afford to give every family three blankets and it would pay out in three years and after that continue to bring us revenue," he said.

To bring out from those present their best ideas on adequate wiring promotion, he used the "Phillips 66" method of breaking up the audience into groups of six with a chairman and secretary. Each had six minutes in which to talk intensely about the subject and come out with some recommended ideas. The four ideas that were listed as the most important by the four groups were (1) education of the customer to recognize a good wiring job when he sees it and to ask for it through some common denominator; (2) standardization of costs on 100-amp service as a packaged price, agreed to by the contractor and recognized by the investor; (3) conduct a campaign to make employees in the industry more aware of the need for Housepower; (4) similar to the last.

Louis Sirois, University of Denver, followed with a powerful talk on the "Power of Words," in which he emphasized that the other tools of promotion are of little value unless accompanied by sincere speech and sincere interest in the people served.

A panel consisting of Jack Callahan, Radio and Receiver Division, General Electric, Shirley Huntsman, Public Service Co., Lee Shipton of Ward-Carey Distributors, Tom Sullivan of Live Better . . . *Electrically* and Lou Alby, General Electric sales promotion, under Chairman M. J. Johnson of General Electric Co., answered questions from the floor relative to utility merchandising policies, salesmen, sales compensation, training, sales meetings, free give-aways, etc.

The conference was attended by more than 275 from all branches of the industry in the region, many accompanied by their wives. R. D. Moody, Allis-Chalmers Mfg. Co., masterminded the spring conference committee, which handled all the multitude of details. In charge of various functions were Donald T. Spangenberg, general sessions and publicity, R. M. Gardner, accounting, J. L. Vanneman, adequate wiring, J. Y. Parce, engineering, Harold H. Rust, entertainment, J. Robert Irion, hotel arrangements, P. J. Kronenberger Jr., information, John R. Dalsant, sales and promotion, and Ed Bledsoe, sociability. The affair concluded with a banquet and entertainment on Tuesday evening, over which Moody presided.

The following day the joint meeting of the RMEL and the Illuminating Engineering Society, Rocky Mountain Chapter, was conducted. This meeting will be reported separately next month.

Below—The 200-amp service pioneered by Spokane builders in 28 new all-electric homes

# Pioneering Still Goes On

Western people still are pushing back the horizons—with new ideas. Traditionally they are quick to adopt and adapt new concepts for doing things better, easier and more pleasantly. Here are a few examples of modern designs that put Western applications in the vanguard of electrical development.

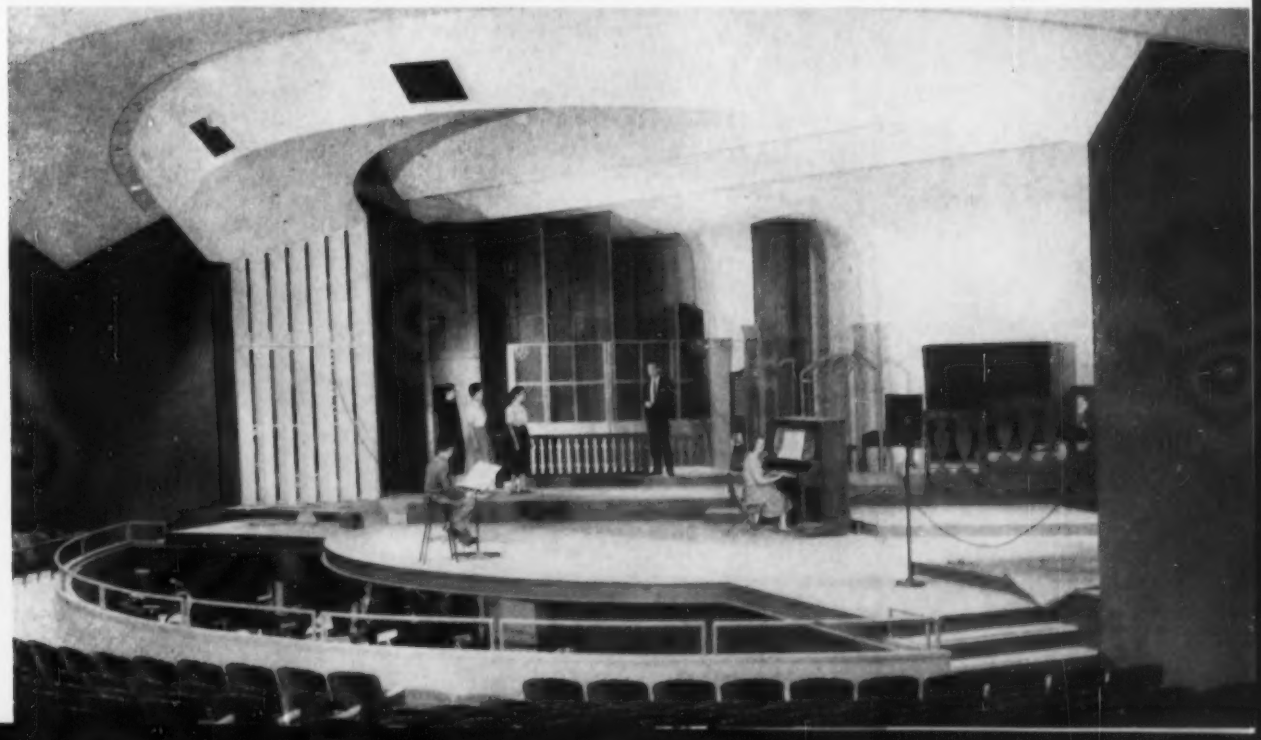
Left — Light is embodied as an architectural feature in this Western shopping center

Right—A luminous kitchen ceiling is a popular selling feature of this modern home in Phoenix

Below — High-voltage (600 v), high-frequency (400 cycle) lighting installation is an innovation at the new gymnasium of the University of New Mexico

## *Things Are Happening Out West!*

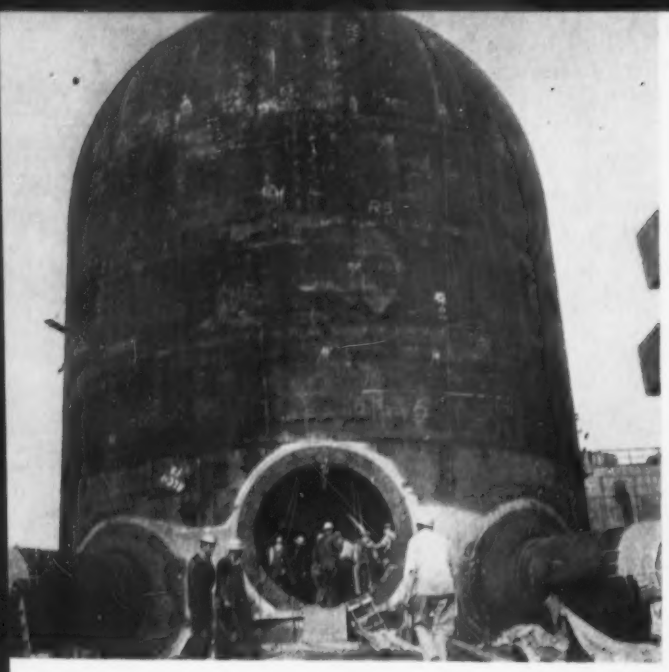
Below—Ultramodern concepts and lighting effects put this new Stanford University theater years ahead of conventional designs



# Research—

## A New Western Industry

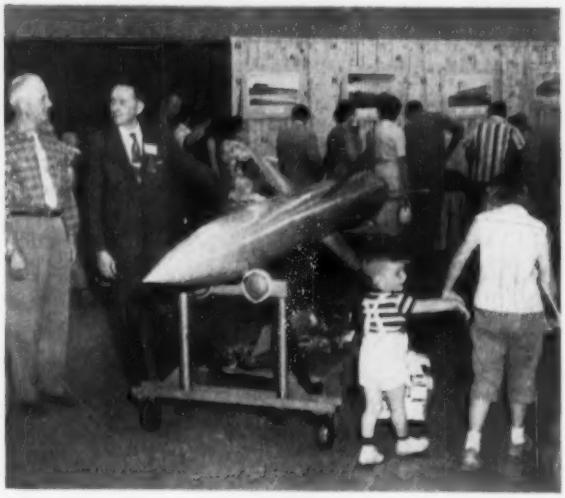
The West is becoming the research center for tomorrow's new industries. In the vast Westward migration of people and industry, research groups have been a strong contingent. Western climate, resources and other facilities apparently have appealed to the newest of the nation's industries. Now concentrated in the West are many of the leading and largest research centers for everything from guided missiles to irradiated foods, and all scheduled to play important roles in the future of civilization and our economy.

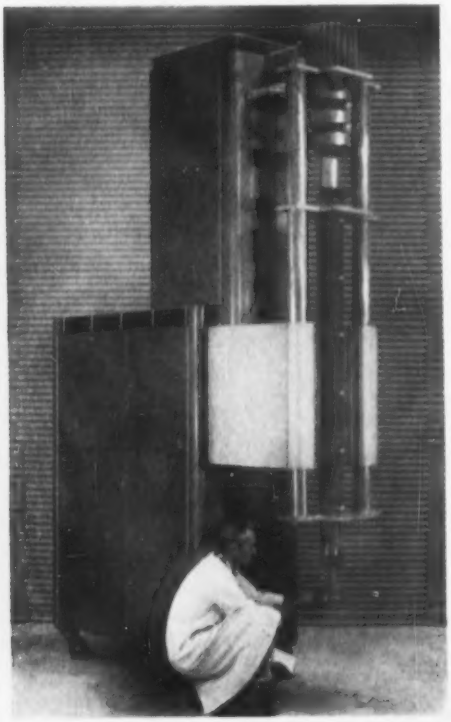


ATOMICS — This is the housing for the boiling water reactor at General Electric's new Vallecitos atomic laboratory near Pleasanton, Calif., and close to University of California's Livermore radiation laboratory

GUIDED MISSILES — The Terrier missile on display at Motorola's opening of its new, large military electronics center in Phoenix, Ariz.—one of the many new Western plants devoted to electronic systems research

IRRADIATED FOODS — This 10,000,000-v linear electron accelerator of the Applied Radiation Corp. will inaugurate a new era in food preservation. The Army is building a huge new experimental irradiated food facility near Stockton, Calif.

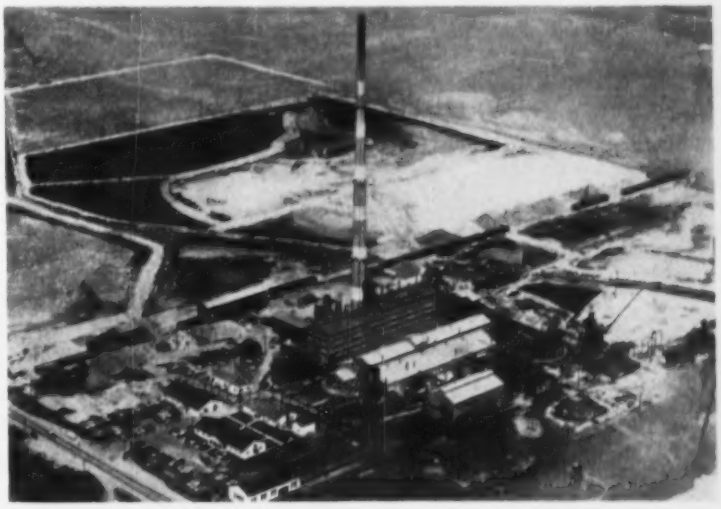




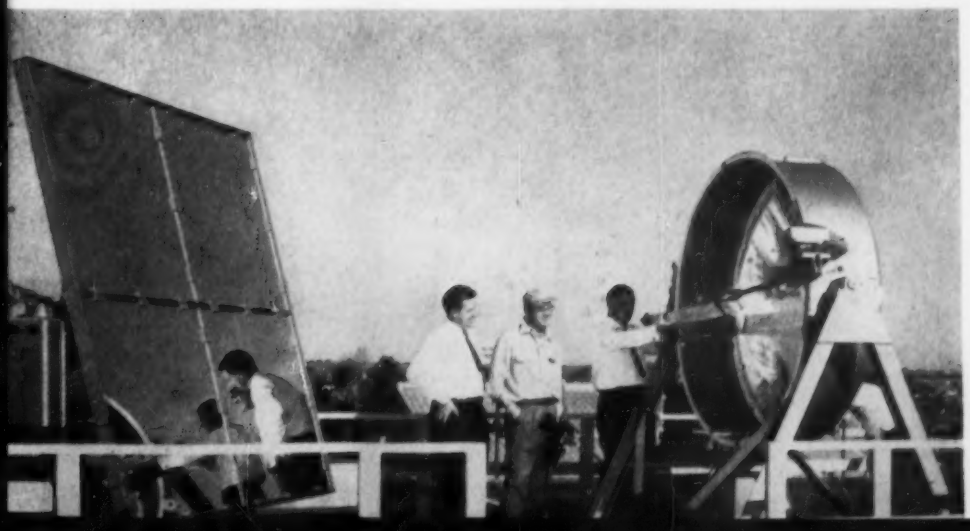
COMPUTERS — One of the major U. S. centers for computer research is this new laboratory of International Business Machines near San Jose, Calif. Not shown, but adjacent to the laboratory is an IBM huge new computer manufacturing plant

ROCKET ENGINES—Deep in a remote Western canyon are these $1,000,000 test stands built by the Rocketdyne Division of North American Aviation, Inc. Rocket engines developed here are for ballistic missiles

NUCLEAR FUELS — The West's mineral resources take added importance with the need for nuclear fuels. This is the Vitro Uranium Co.'s uranium refinery in Salt Lake City, Utah—one of the many new nuclear fuel processing plants in the Rocky Mountain area



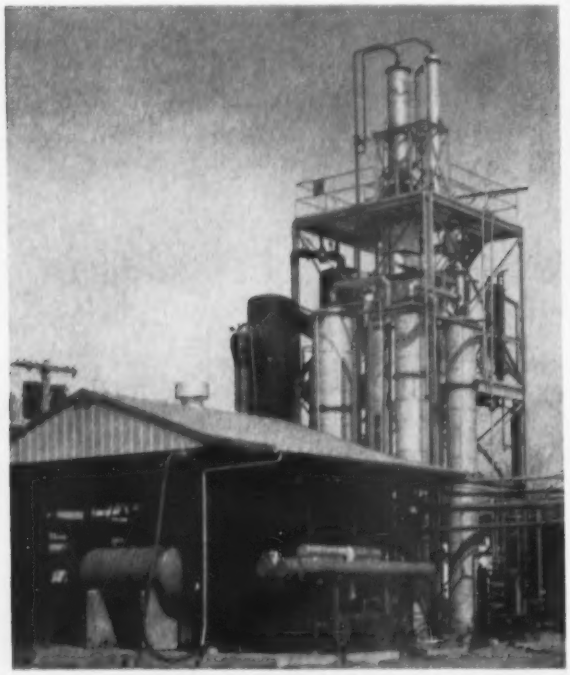
SOLAR ENERGY—The Pacific Southwest is now being looked upon as the world center of solar research. This is a solar furnace installation at University of Arizona — many other similar study centers are concentrating on utilizing the sun's energy to augment fossil and atomic fuels

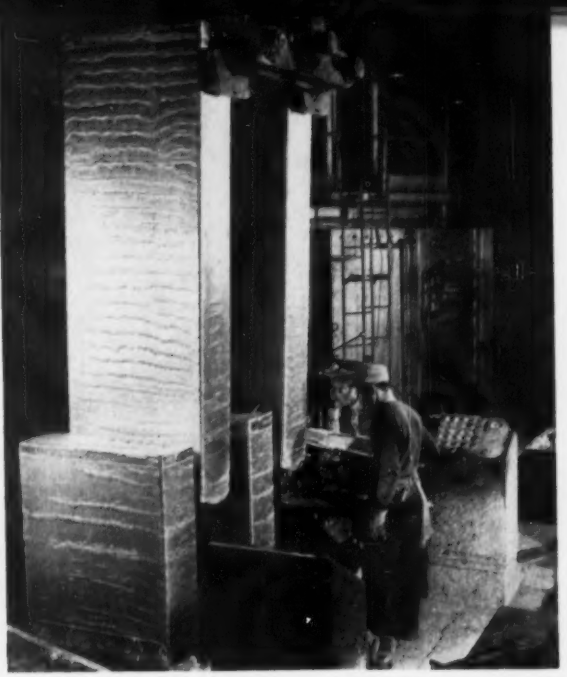


*Things Are Happening Out West!*

# The West Matures-- Industrially

Western industry is growing fast in a big way. Pictured here are some of the large developments that are making the West the third largest regional industrial employer in the nation.

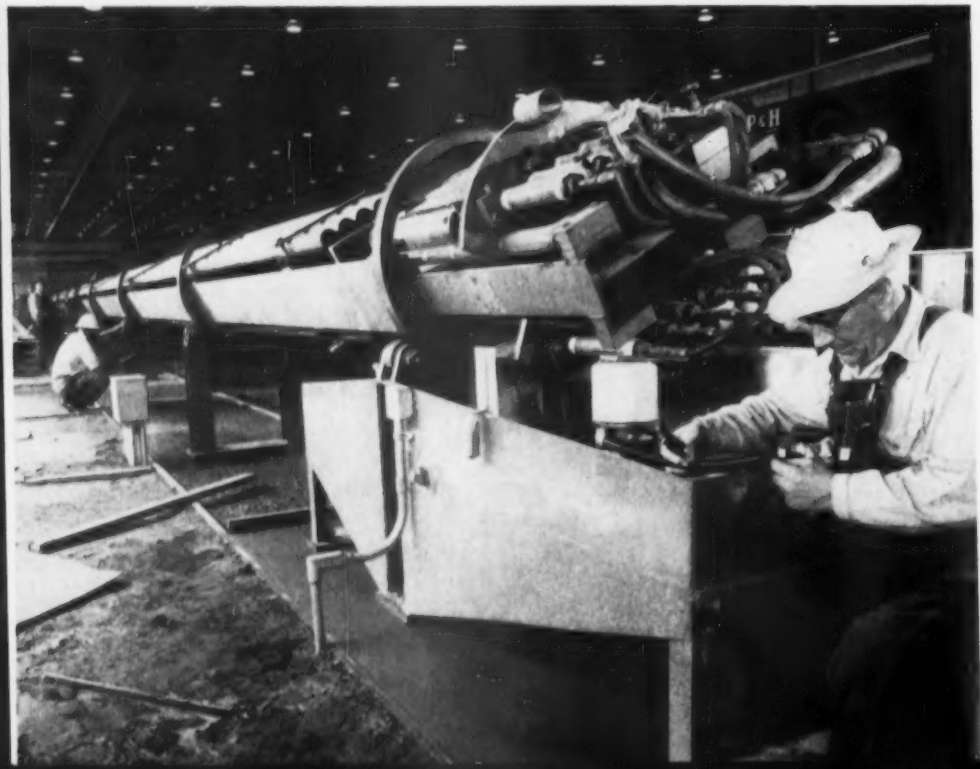




ALUMINUM—New central casting station at Kaiser Aluminum & Chemical Corp.'s Mead, Wash., plant produces 5,000-lb ingots for sheet and plate products

CHEMICALS — Typical of the many and varied chemical process plants being completed throughout the West is this formaldehyde production unit of the Borden Co. at Kent, Wash.

COMPONENTS—Late this year American Brass Co. will be producing tubes, sheets, rods and other wire-drawn products at this new $15,000,000 mill at Paramount, Calif. This is a view of a quintuple-die copper tube draw bench—producing five tubes at a time, each 125 ft long



*Things Are Happening Out West!*

**ASSEMBLY PLANTS** (right) — This vast new Los Angeles facility of Ford Motor Co. will be production center for the new Edsel car—scheduled to come off the line by midsummer

**AIRCRAFT**— Latest and one of the largest additions to major Western industry is this huge 1,000,000-sq-ft plant which will produce the Douglas DC-8 jet airliner. A concept of its size is given by comparison to the people and the DC-8 in the foreground

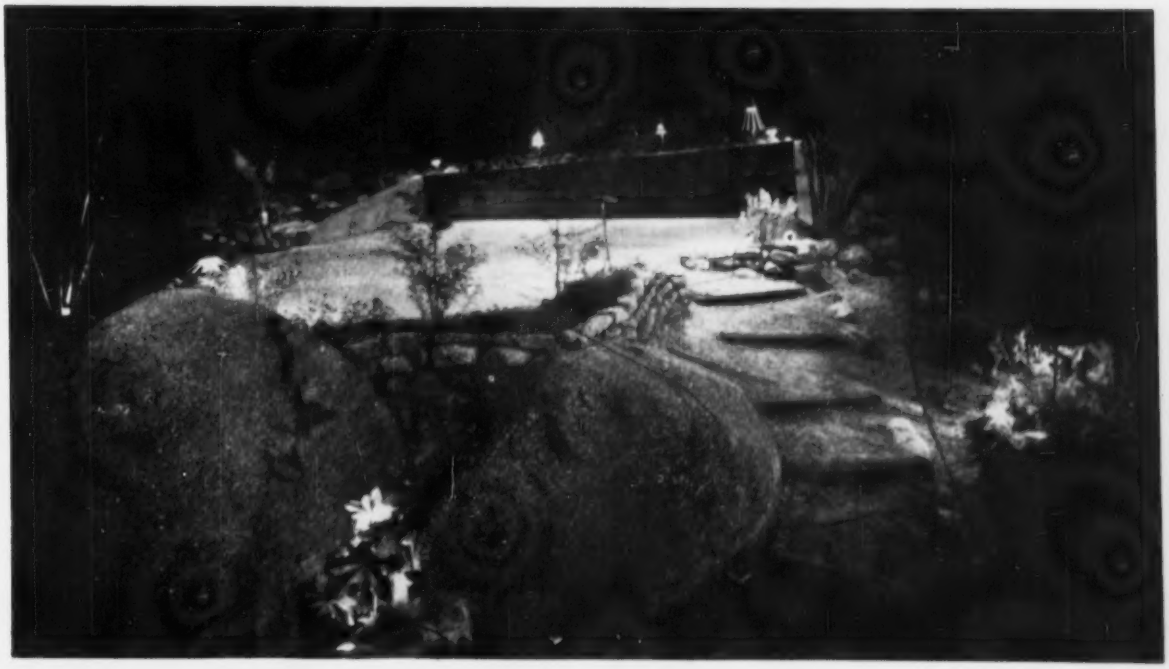
**MISSILES** — In the foothills of the Rockies 20 miles from Denver 5,000 people will be working at this Martin plant, testing air-frame designs and fabricating intercontinental ballistic missiles

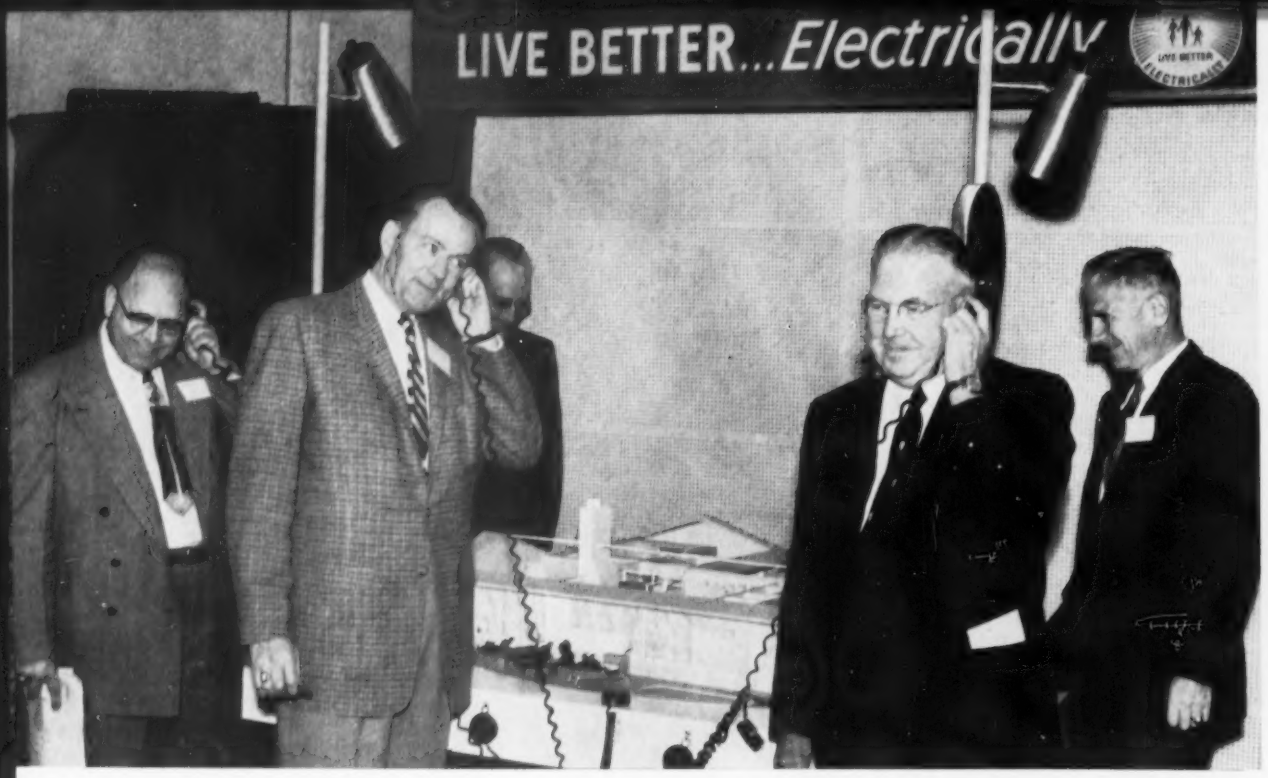
# Outdoor Living

All pictures except the one at the bottom of next page were taken in the garden of Vern Sharp, contractor-dealer of Salt Lake City, shown with Mrs. Sharp, right

Westerners live more out-of-doors. From the verdant Northwest to the fascinating desert settings of the Southwest, garden lighting is a popular means of extending the hours of enjoyment that people spend out in their gardens and on their patios and lanais.

## *Things Are Happening Out West!*






The Talking House is telling how to live better electrically. Frank Falge, far right, brought it to Vancouver

**NELPA Conference speakers**

# Tell How to Meet Competition

"WE don't need to be afraid of natural gas but we do need to be concerned. We do need to be alert. We must anticipate their every promotional move and be out ahead of them every step of the way."

This statement by Chairman A. S. Gilbert at the Northwest Electric Light & Power Assn.'s 32nd annual Business Development conference was typical of the forthright discussion centering around the theme, "Meeting Our Competition Through Salesmanship." That the section was ready to back up honest talk with action was evidenced when it passed a resolution to recommend to the National Electric Code Committee modernization of present home wiring standards.

J. R. Poteat, G-E, Louisville, told what to expect from the competition

The conference at Vancouver, B. C., May 6-8, was attended by some 150 from utility sales, advertising, promotion and rate departments and their industry allies. Recognizing the common interest today in all phases of the sales job, the program planners reversed the usual pattern to bring the entire group together for all sessions except one afternoon of concurrent bureau seminars. Approval of this method was voiced by delegate after delegate, who was glad not to have to choose between interests.

The well-coordinated program gave a realistic appraisal of the competitive situation facing the Pacific Northwest and suggestions for meeting it in various sales areas. From the welcoming address of H. L. Purdy, B. C. Electric Co. executive vice-president, and its long-distance response by NELPA Vice-president John T. Kimball, Idaho Power Co., to the closing words of the incoming section chairman, Otto Zwanzig, there was ample assurance that the industry is putting imagination as well as effort into its sales job.

The industry programs, Live Better . . . *Electrically* and Housepower, mentioned frequently during the three days, had the spotlight all to themselves on the final morning. It was then that James Paxton, Spokane electrical inspector, proposed a new formula for determining demand load in residences and received unanimous approval of his resolution. This session also ran the premiere showing of the new Live Better . . . *Electrically* film.

Unfortunately, space does not permit full coverage of the many fine talks. It is hoped, however, that brief summaries will serve as a re-

Al Krieg, H. L. Purdy and Chairman Gilbert started the conference off

minder to those who attended and will give some of the flavor of the meeting to those who could not be present.

### "We Can Make Them Bigger"

With perfect timing, Purdy's welcome had just ended when the telephone rang and Kimball was on the line from Washington, D. C. Heard as clearly as though he were in the room, Kimball pointed to the challenges, opportunities and responsibilities that must be met today to achieve the wonderful opportunities that lie out ahead.

"You folks are salespeople and possessed of the optimism, inspiration and the ability to look for and accept change so necessary to looking for and achieving what tomorrow has in store for us," he reminded.

Pointing to the forecasts for 1975 in terms of population, employment, personal income and retail sales, he said that we can make them bigger if we start today. By 1975, he said, we may have found a new, better, cheaper way to make electricity and to get it from where it is made to where it is used. "Our challenge is to continue to earn our place in the acceptance of the public. We must find ways to bring better service at lower cost, to have an industry that is more efficient even than it is today."

Kimball believes this is going to require organization growth and strengthening on the part of every company; better planning and coordination of effort in all areas of work; better control of results obtained and a better job for our customers within cost limitations known to be reasonable to us and acceptable to the people we serve. Selling of the highest order will be needed, he said, and the most important ingredient is attention – attracting, meriting, paying and holding attention. "The future belongs to those who can see with imaginative insight into what that future may be made to be."

The first part of the program ended with the introduction of Al Krieg, NELPA's new executive manager, who was meeting many in the group for the first time. In addition to his own greetings, he brought those of Berkeley Snow, his predecessor.

### Here To Stay

Any idea that gas competition is temporary was dispelled by Chairman Gilbert and J. R. Poteat, general manager, Range and Water Heater Division, General Electric Co., Louisville. Both warned that pipe lines cost money and are not likely to be pulled up just because the going gets rough.

Poteat added: "Let's be sure we recognize natural gas as a formidable competitor here and now. For years the gas utilities have been pouring five cents a meter into a common national fund to sell the uses of gas. They have operated with a two million dollar annual budget and this year have appropriated an extra two million for a weekly TV program. This will be supplemented by local tie in.

Among the things to be done, according to Poteat: program home service girls to find out how the homeowner feels about her electric servants, how up to date they are; learn what the retailer thinks about natural gas; keep the advertising approach direct and hard hitting (a public relations approach to advertising is not adequate to retain electric load); re-educate employees in

Modernization of home wiring standards was asked by the group. Conferring here are James Paxton (left), Spokane electrical inspector, who proposed code modification, and three top code authorities, who commented favorably: O. K. Coleman, Duncan Electric, and H. H. Watson (right), G-E, both panel chairmen on NECode committee, and W. L. Gaffney, Tacoma electrical inspector, a member of the code correlating committee

A. W. J. Smith and R. G. Scott of B. C. Electric headed arrangements

John Taylor, BCE (right), coordinator of utility panel with D. J. McGonigle, Montana Power, Dorothy McGregor, BCE, C. E. Filbin, PP&L

W. R. Milby, Detroit Edison, and C. W. Brissenden, PGE, took a look at the industry's Housepower program

Sam R. Fogel, Cockfield Brown, was speaker, Harold Merilees, BCE, presided at Monday's luncheon session

the value and advantages of electrical living; get the old inefficient electric ranges out of the home and new modern ones in; consider applying sales incentives at the distributor level; hit on the front line, house heating, and thus protect water heating and cooking; use the quick recovery water heater as a competitive weapon; keep electric service before a fickle and changing public, by continuity in promotion, selling and advertising; have the competitive as well as the cooperative spirit.

Advertising that is designed to meet competition has to be simple and interesting, Sam R. Fogel, creative director, Cockfield Brown & Co. Ltd., said in his luncheon talk. It has to tell a story and be dramatic. It has to create a mental picture and give an urge to action—to see the product, to want to use it and to want to buy it.

### Utility Promotions

That many of the suggestions put forth by the morning speakers are being carried out by member utilities was shown in the reports of outstanding load building and retention activities. This presentation, with John Taylor, Metropolitan sales manager, B. C. Electric, as coordinator, briefed nine promotions by individual companies.

Lou Growney, PP&L, told how his company is helping the forest products industries and presented a recent company study on wood composition board that is being used generally as a training and sales manual. Dorothy McGregor, B. C. Electric, showed slides of the Ease of Living Home, which BCE used most successfully in promoting lighting. (E. West, September 1956.)

Don Runyard, Copco, pointed to the electric freezer as a promising load that can be sold now on its own merits without gimmicks. Darcie White, Utah P&L., described a dryer promotion that netted 8,000 contest entries and helped push 1956 sales from a projected 7,800 to 9,615 units.

Studies leading to Washington Water Power's promotion of electric heating were described by Harold Wright of that company. (A future issue will carry details of this promotion.) R. J. O'Connor and W. R. Reed of Idaho Power told of their company's salesmen training program to meet gas competition.

Pointing out that his company wants the customer to make money on every service application, W. R. Riordan, California Pacific Utilities, pointed to some sprinkler irrigation installations that pay out. Details of Montana Power's time pay wiring plan were described by D. J. McGonigle, who reported that of 1,586 layouts designed for customers, 1,113 were installed and of these 318 were financed through the company. Average price was $290. As the plan has been worked out company, customers and lending institutions are happy, he said.

Final speaker on the utility promotion panel, Nick Mason, PGE, brought down the house with his description of unsuccessful attempts to bring his Electri-Living Home slides and a housepower exhibit across the border.

Tuesday's program featured the bureaus, with a morning general session and an afternoon of parallel seminars. Morning speakers appeared again at the seminars to give opportunity for more detailed discussion. (See bureau reports.)

### Housepower

The electrical contractor is the key to the success of the Housepower program and should not be treated as a second-class partner in the industry, W. R. Milby, Detroit Edison Co., stated in telling what his company and the Detroit Electrical Assn. are doing to make contractors effective sales allies.

Called the Housepower Forum on Residential Wiring, the activity was set up as a sales training course for the pool, Contractor's Services, started by the electrical association four years ago.

Six forum sessions, giving sales methods and training in business operation were offered for $15, with an additional charge of $1 for a journeyman. Instructors were two university professors and a business man. The 12-hour sales training was followed by two technical sessions conducted by men well known in the electrical industry.

Recognizing that a one-shot course won't do the job, the sponsors plan a continuing educational program to include business management, management of assets and records, human and public relations, sales devices, advance selling.

Contractor's Services, directed by an advisory committee composed of three contractors, two utility representatives and the executive secretary of the electrical association, includes contractors in good standing who join the group and agree to answer all calls promptly, take all types of calls, attend five of the six training sessions.

Utility servicemen leave cards noting wiring defects and advising the customer to call her electrical contractor or, if she does not have one, to call Contractor's Services. Calls are dispatched to participating contractors on an area basis.

Gordon DeFoe, Washington Water Power, who introduced James Paxton, had raised the code question at last year's sales conference. In presenting his resolution, Paxton reported findings from extensive tests on Northwest homes indicating that the code method of calculating service demands for present-day residential connected loads is too conservative and should be modified to recognize diversity of appliance use. (EWest, September 1956, p 119.) He emphasized that there is no conflict between his recommendation and Spokane's 200-amp expandable service and that there would be no sacrifice of quality or safety.

Briefed the resolution asked that the demand load for single or two-family dwellings having provisions for electric ranges be calculated as the sum of 11 kw plus 35% of the connected load in excess of 11 kw. The connected load, it said, shall be assumed to be equal to the sum of 3 w per square foot of floor area plus 1,500 w for small appliances, plus 12,000 w for an electric range plus the sum of the wattages of all additional connected appliances, including water heater, clothes dryer, incidental space heaters, furnace and similar permanently connected appliances.

Bureau speakers: Robert M. Wood, Ebasco; Karl Runkle, G-E; Rich Bakes, WWP, Farm Bureau chairman; Wes Dunn, PP&L, Electric Home chairman

### Growth Means More Capacity

Although B. C. Electric satisfied the demands of its market in 1945 with a generating capacity of 300,000 hp, it will need 1,500,000 in 1960, 2,400,000 in 1965 and upwards of 9,000,000 in 1980. This was brought out by Dr. Purdy in his Wednesday luncheon talk.

The lower mainland has hydro resources within economic transmission distance to meet its needs until 1961 or 1962, he said, but after that must look elsewhere, probably to the Columbia. Therefore he finds two conclusions inescapable: (1) on-site development of power on the Columbia system should go to serve the whole southern portion of the province; (2) if important downstream benefits for U. S. plants develop from storage in Canada, British Columbia should take its proper pay for the cost of creating these benefits in kwh.

### Next Year's Conference

The 1957 conference will have Montana Power Co. as host, with the place still to be selected, it was announced at the luncheon. New bureau chairmen are: Darcie White, Utah P&L, Electric Home; Arno Gish, PP&L, Commercial and Industrial; George Challenger, BCE, Rural and Farm. The two independent committees meeting with the section will be headed by Gilbert Stanton, Idaho Power, Public Relations and Advertising; Jack Polson, BCE, Rate Research.

Industrial Bureau chairman, Jerry Collins, PGE (far left) and speakers: W. C. Ayres, Hotpoint; G. D. King, Sylvania; Blair Plowman, WWP

Gordon DeFoe, WWP, and James Paxton, Spokane electrical inspector, talked on National Electric Code revision

Jeanne Faulkner, NELPA, drew "lucky" number; L. C. Aston, WWP, won gag $100 bill

### Entertainment

Arrangements were capably handled by R. G. Scott, B. C. Electric, Vancouver, and A. W. J. Smith, BCE, Victoria, and their committee. Outstanding were the tours of B. C. Electric's new Vancouver headquarters, a model of efficiency and design that is spectacular by day or night.

Entertainment, too, was outstanding, with S. V. Grisdale, Canadian General Electric Co., Vancouver, as chairman for the manufacturer-distributor cocktail parties and the banquet program. The ladies were warm in their appreciation of the program arranged for them by Mrs. H. L. Purdy.

## Commercial and Industrial Bureau

*L. J. Collins, PGE, chairman*

The time to move up on electric cooking is now in the opinion of W. C. Ayers, general manager, Commercial Equipment Department, Hotpoint. The market is there, the product easy to demonstrate and sell, he believes. The wiring bottleneck can and will be broken, he declared, and new construction is offering many opportunities. The boom in educational and religious buildings, hospitals, industrials, hotels and motels and restaurants furnishes excellent prospects. There is no need to apologize on cost, Ayres thinks. Nobody uses gas lighting or horses and the same applies to electric cooking, if the industry gets the story across.

Speaking at the afternoon session, Don King of Seattle, division engineer, Sylvania, declared that the industrial growth for the Northwest is rosy, and that a planned program by utilities and interested agencies can put specific areas way beyond the forecasts. With its contribution to good load factor in industrial plants it can be a profitable business, he reminded, and the know-how, the tools and sales helps are available.

How "Watts Beat Jets in '56" was told by Blair Plowman, Washington Water Power. This campaign, which won the Hughes Award, added $31,458 EAR in a six-month period; used another three months to inspect 565 kitchens and suggest repairs where needed. The company helped finance the wiring and repairs. Commercial kitchens of various types, and in some cases individual appliances, were submetered to give the company information on kwh and demand; on cost of electric cooking per meal and in percentage of gross.

Otto Zwanzig, BCE, '57 section chairman, Frank Reis, PP&L vice-chairman

## Electric Home Bureau

*Wesley Dunn, PP&L, chairman*

Light for Living, a program developed by Ebasco and G-E to sell residential lighting by the roomful and homeful, was described by Robert M. Wood of Ebasco's sales, marketing and public relations department. This promotion does not budge from the industry's accepted standards, he declared, but has built sales emphasis on glamour — such things as valance and cornice lighting, lighted planter boxes, garden lighting. It uses the strong appeal of the new colored lamps, which incidentally add wattage. Basic target is the middle 60% of customers on the economic scale. The utility was selected to do the education job on this project and it is suggested that it have a team devoting itself exclusively to home lighting. Since this is a year-round promotion, costs in the early stages will be high in proportion to results. But over a 10-year period it is expected that, for every dollar per customer spent, the utility will get $20.10 in revenue.

With today's larger, more expensive houses, opportunities to promote all-electric living have been increased tremendously, Frank M. Falge, Western regional manager, Live Better . . . *Electrically*, pointed out. This and the fact that the builder is a worried man and willing to pay for good advice on sales appeal make it a good time to sell the electric package. When laying plans for active promotion of all-electric homes three and possibly four loads are of greatest importance, he said. They are heating, air conditioning, water heating and

clothes drying. Aids available from LBE were shown.

How home service sells electrical living was reported by Jean Mutch, home service consultant, B. C. Electric. Her department has recently entered the commercial field and has the nucleus of a good library on large quantity food operations. It is also cooperating with the construction trades, preparing free kitchen, laundry and home wiring plans and offering home advisory services on lighting and space heating. These are just two phases of BCE's comprehensive home service program. Discussion indicated that home economists believed it is desirable to have a separate consultant on home lighting.

Home economists: Janet McNair, WWP; Jean Mutch and Dorothy McGregor, BCE; Anne Ogden, PGE; Beatrice Miller, BCE; Dorothy Smith, WWP

### Farm Bureau

*Rich Bakes, WWP, chairman*

The farmer needs more electrification if he's going to stay in business and it is the industry's job to tell him so, K. H. Runkle, manager, General Indutry and Sales Division, General Electric Co., Schenectady, stated. To help tell him and sell him EEI has designed the Farm Better Electrically program that can be used in combination with Live Better . . . *Electrically* and Housepower. The story must be taken even to the successful enterprises that now have electrification because more is needed to bring lower costs and greater profit margins, Runkle declared. Some electrical equipments do not consume much power themselves and, therefore, do not look inviting to sales promotion, he said, yet may make possible the use of other devices creating a profitable load.

At the afternoon session the bureau had a lively discussion centering on three-phase service to remote farms. Some utilities are asking the farm customer to install a phase converter for his three-phase large motors in order to delay the time for extension of full three-phase service. Dealer representatives maintained that utilities should provide three-phase even earlier than economic justification allows in order to maintain good customer relations and aid in load building. Converters have given satisfactory service but it was agreed they are poor substitutes for three-phase lines. The trend seems to be toward utility acceptance of earlier installation of three-phase.

Allowable horsepower for across-the-line starting of motors also is rising. Idaho Power Co. accepts up to 200 hp and other companies are moving in the same direction.

Bakes summed up the discussion and pointed to two opposing trends: much farmland is being changed to residential by expanding suburbs and the remaining acreage is being farmed by fewer and bigger customers. Thus, he said, the characteristics of farm customers are changing from a similarity to residential load to be more like commercial or even industrial load.

## Rate Research Committee Meets

Methods of estimating electric water heating saturation from bill distribution and the effect of various methods of cost allocation on the estimation of cost of electric service highlighted discussions of the rate research committee.

On the determination of appliance saturations, Chairman J. A. Polson, B. C. Electric Co., presented a short paper outlining a simple method of estimating water heater saturation in residential groups based on the bill distribution of consumption.

Methods of arriving at such information included the records of dealer sales and appliances, the market surveys that are conducted by some newspapers in connection with their city directory surveys, checks that some gas companies make at the time of meter change every six years and the analysis of winter consumptions to detect space heating customers.

Attention of members was drawn to the caution that must be exercised in using survey data in one area of information when the survey was primarily designed for some unrelated field of information, that is, the sample selected for the second and primary use may be quite different from that required for the secondary use.

Some members reported on tests made recently, principally on space heating and, in some cases, large residential customers. The tests are not yet evaluated and only general conclusions could be given.

There seemed general agreement, however, that for the space heating customer, coincidence factor (based on system evening peak) is in the neighborhood of 60 to 70%, as compared to an appreciably lower factor for the large nonheating customer.

On the test data as related to temperature, it appeared that the degree-day vs kilowatt-hour relationship was definitely linear and the peak vs temperature relationship was parabolic leveling off quite completely by 0 F (which was the design temperature for the houses in the test area).

Members agreed that space heating created no very excessive costs on the distribution system but there was some difference of opinion as to how the production costs for the system should be assessed.

Consideration divergence in practices and opinions regarding cost allocations and general approach to be followed was revealed in a discussion of comparative study of the various methods of cost analysis.

A method of allocation based on plant capacities was outlined by Polson.

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ELECTRICAL WEST

## One-Third Gone

IN CASE you have been wondering why there has been so much pressure for budget cutting at the federal level, recent tax figures provide the answer. The tax bite, which heretofore has only been taking big chunks out of the taxpayer's hide, is now beginning to verge on the process of actual dismemberment.

Back in 1954 the total federal, state and local government tax receipts totaled $89.6 billion. Two years later, in 1956, the total tax take had jumped to $107.6 billion. In that year the national income was around $343 billion so that tax levies of one form or another took away about one-third of the national income.

Looking at it still another way, everyone now spends one-third of his time working for the government. From still another viewpoint, the country is one-third socialized because a continuation of the present trend for another 50 years would result in a 99% tax take of the national income.

Outcries against high taxation are a healthy sign. Demands for economy in government, more and more, are coming from the rank and file of the body politic. The tax bite hurts plenty but it will be only one-tenth as painful as the blight that can come if people permit their elected representatives to spend the country into socialism.

## Accident Prone

MUCH attention is being given to the development of efficient accident prevention programs. One phase of this activity, which seems to deserve more attention, is the study of individual personnel records to reveal accident repeaters.

At one of the recent industry conferences, discussion brought out the fact that a study by one company revealed that 5% of the employees had had three accidents in 6 years. One fatality that occurred was a man who had previously chalked up five other accidents.

Psychologists may say that there is no such thing as an "accident prone" person. However, there may be people who are not temperamentally suited to work on certain types of jobs. Replacing these square pegs in different types of work might have a very beneficial effect on the accident records and, at the same time, reduce the human and economic losses corollary to working safely.

## Spokesmen Needed

AUTOMATION is coming faster than most people realize. No industry is immune; no process too simple to warrant study. The process of automation has been going on ever since Watt invented the steam engine but it has only been in recent years that real acceleration of the application of this new technique has occurred. The impetus behind this rapid growth has been the demand for greater productivity per man-hour and the ever-increasing pressure to keep production costs to a minimum.

Automation is coming despite resistance from certain areas of management and from uninformed segments of labor. Managements, in many instances, have to be sold that the relatively high costs of automated plants will pay out; labor has to be sold that automation, rather than creating unemployment, upgrades the worker, points the way to more leisure time and, by some alchemy of economics, actually creates more jobs.

There is much missionary work to be done, far more than the various experts on individual automated processes can or will do. This missionary work has to be done on a broad front that will sell the concept, the desire and the over-all benefits of what automation offers in all of its various stages and phases.

It would seem logical that the industrial power salesmen of the utilities should be the spokesmen for automation. They act as consultants and advisers to industries, large and small, in their service areas. They long have been the

# EDITORIAL VIEWS

apostles of applied electricity. They very easily could become the task force that could tell and sell automation in all its ramifications.

And therein lies the catch. Automation is a broad and complex subject whose many facets are continuously being refined and polished. It would be unreasonable and impractical to expect a power salesman to be an expert in all of the intimate details of every automated process. But it would not seem unrealistic to keep these industry representatives well informed on the general applications and new methods that continually are being developed. This could be done by seminars, at programs of the professional societies and through the agendas of the industry's associations. It may not be too bold to suggest that a separate "automation committee" should be included in each of the business development sections of PCEA, NELPA and the RMEL.

In the long run, well-informed representatives are the best evidence of the industry's desire to serve its customers well. It is not too soon to develop a corps of trained people who can give direction and enthusiasm to this ever-broadening new technology.

## New Role

RESIDENTIAL lighting, always a high yield load, may become even more attractive in the future. Many companies, confronted with a high summer air conditioning peak, are looking for ways and means of "filling in the valley." What better load is there than improved residential lighting which will come on the lines after the day's thermal peak has been reached and will continue to grow in energy use through the winter months as the days get shorter?

It's time to take another good look at the importance of residential lighting in its relationship to the over-all system net. It could be that stronger promotional efforts in this area will yield a higher return than ever.

## Backlash

IT'S paradoxical to the point of ludicrousness to watch the two socialistically inclined senators from Oregon try to circumvent the preference clause for the benefit of their own constituents. Neuberger and Morse are finding it difficult to answer the cries that Oregon is not getting its share of Columbia River power because the Washington public utility districts get first claim under discriminatory preference policies.

Neuberger has tacitly acknowledged the inequity of the preference clause by proposing a pseudo power marketing agency for the state which, in turn, might sell power that it obtained under the preference clause to existing free-enterprise distribution agencies.

The proposal, by the way, probably wouldn't get to first base in any judicial test—just as long as the preference clause remains in the law. It, however, is typical of the type of thinking indulged in by politicians when a pet theory backfires. It would be too much to expect a logical conclusion that preference in any phase of government operations is unfair and un-American.

*AS WE PUSH toward the outer reaches of creative ability, each new proposition becomes more complex, each problem more difficult to master. We are working with ever-higher temperatures and pressures, finer tolerances, harder and rarer metals, larger units, faster speeds. Each time the electric utilities double their generating capacity within the historic 10-year period or less demanded by our economy, the effort becomes more massive, until it begins to approach the superhuman.* — Gwilym A. Price, president, Westinghouse Electric Corp., before the All Engineers Dinner, Chicago, Ill.

The bound proceedings of the workshop are displayed, with pride, by Gus Norwood (right), executive secretary of the association. Waiting for his copy is Andy Genor of the Line Material Industries, author of one of the papers in the mimeographed book

Carroll Northrup (left), operating superintendent of the Franklin County PUD, Pasco, Wash., elected as chairman for the next workshop, is congratulated by his predecessor, Robert Gillette of the Grant County PUD

Robert R. Ries (left), engineer with the Grant County PUD of Ephrata, Wash., receives the Milton H. McGuire Award for Engineering Accomplishment from Dean Barline, utilities director of Tacoma, Wash., at the engineering and operations workshop of the Northwest Public Power Assn.

## Northwest Public Power Group Enjoys . . .

# Technology Trading

BY some adroit engineering on the part of Gus Norwood, executive secretary, those attending the engineering and operating workshop of the Northwest Public Power Assn., some 150 in all, were handed a bound book containing all the papers presented at the meeting, April 23-24, in Tacoma. Many of the speakers, anticipating such a move, briefed their comments and devoted more of their allotted time to questions and discussion.

Jack R. Davidson, director of safety and job training, Ruralite Services Inc., described the new program of safety education and training that is being instituted by member companies of the Northwest Public Power Assn. This program will begin with two foreman training meetings in Portland and Spokane, respectively, during June; will include monthly lessons dealing with vehicles; utility operations and first aid; and will be followed by a conference for safety supervisors on leadership to be held during the winter months. Over half of the member companies have signed up to participate in the program, which costs $3 per month per outside worker.

### Microwave Link

The lack of telephone communication between Ephrata, Wash., and the Priest Rapids dam site on the Columbia River forced PUD No. 2 of Grant County to install a small, five-channel microwave link over the 53-mile path between the two points. Carl Johl of the PUD staff described the type of installation selected, which involves one relay station. In addition to two telephone channels, which are multiplexed into the switchboards at each terminal, the system includes a control link to operate a mobile frequency base station near the location of the relay towers. The equipment operates in the 890- to 960-megacycle area.

An excellent discussion on the need for standards of utilization voltage was presented by Quentin Mizer, system engineer for PUD No. 1 of Benton County. He pointed out that voltage level, voltage regulation, continuity of service and voltage flicker are not circumscribed by exact figures, and he recommended that the NPPA Engineering and Operating Section appoint a committee to study the establishment of standards that would bring these elements into some degree of uniformity for the entire area served by the member utilities.

Cost comparisons on the use of aluminum vs steel in substation construction were presented by R. J. Pangborn, chief engineer of PUD No. 1 of Cowlitz County. This utility was one of the first to utilize aluminum alloy substation structures and the initial installation proved to be more economical than the equivalent galvanized steel structure.

Three years later, with the price of materials and labor spiraling upward, the district compared the costs of five aluminum alloy substation structures, three of which were of the bolted type and two of the welded type. The study revealed that field welding of the entire structure created installed costs (81.9c per pound) higher than bolted construction (76.32c per pound), this despite the extra engineering and shop drilling necessary for the latter. The district has standardized on aluminum alloy 6063-T6 for all members except the main strain beams. It also constructs relay and control panels from $\frac{1}{8}$-in. sheets of aluminum alloy No. 30003-H14.

In addition to its resistance to corrosion and contaminated atmospheres, the district has found aluminum alloy substation construction to have the advantages of ease of handling, speed in cutting, drilling and marking, low maintenance and great flexibility in initial application, modification, plus high salvage value.

Other papers described experience with electrical connectors, with particular reference to compression splices (by Kenneth Lien of PUD No. 1 of Cowlitz County); the use of a line fault analyzer of the Sierra Electronic Co. type (by Robert S. Dole of the Clearwater Power Co. of Lewiston, Idaho); and the benefits of comprehensive system metering with particular reference to the use of thermally lagged instruments (by R. E. Kenyon, Northwestern district manager for Sangamo Elec-

(Continued on p 210)

# REGULATOR NEWS

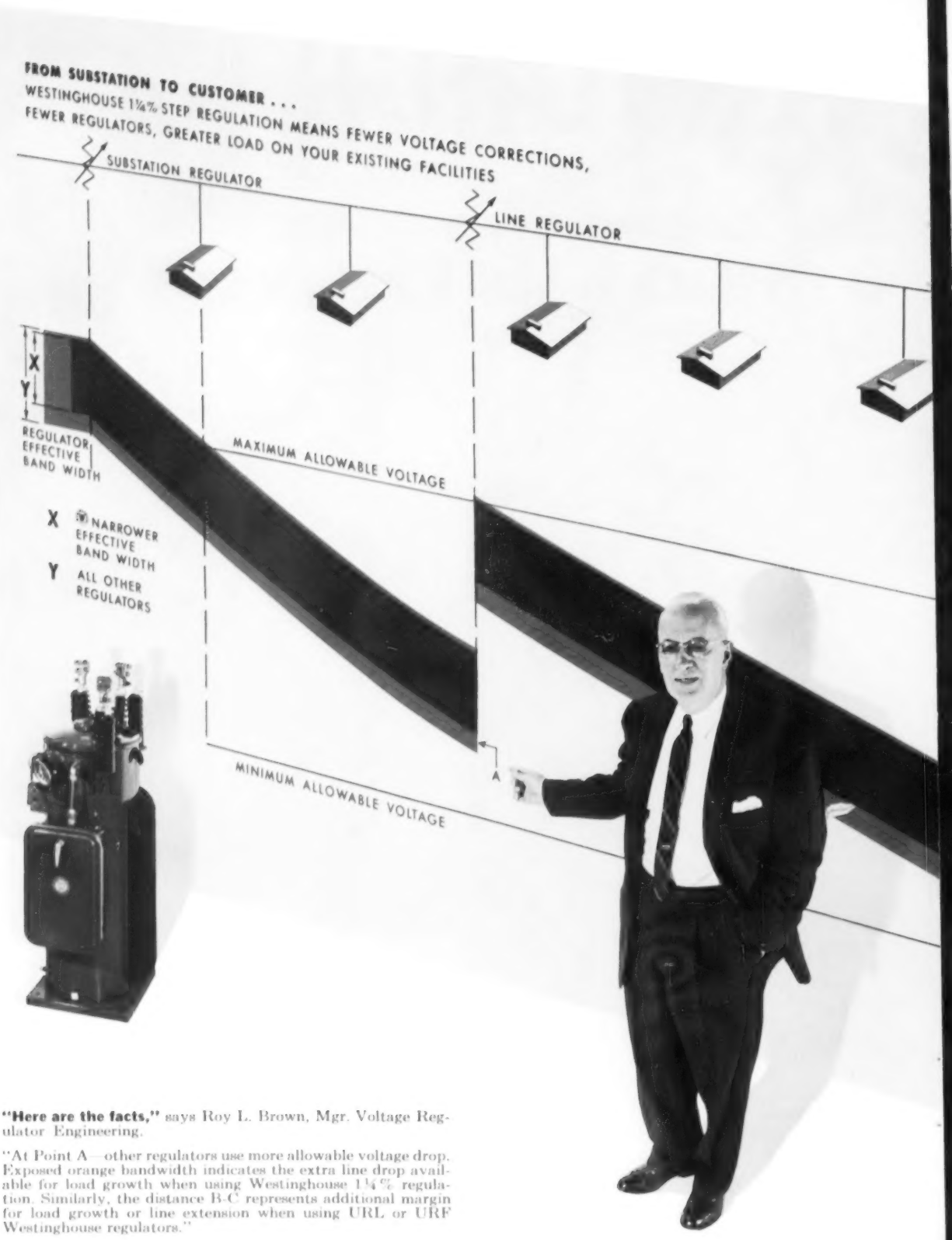
## Westinghouse extends advantages of 1¼% step regulation to higher kva ratings

*Left*—URF regulator extends range of 1¼% step regulation . . . reduces your initial investment for regulators up to 167 kva.

*Right*—URL regulator . . . over 10 years of field experience has proved the superiority of 1¼% step regulation.

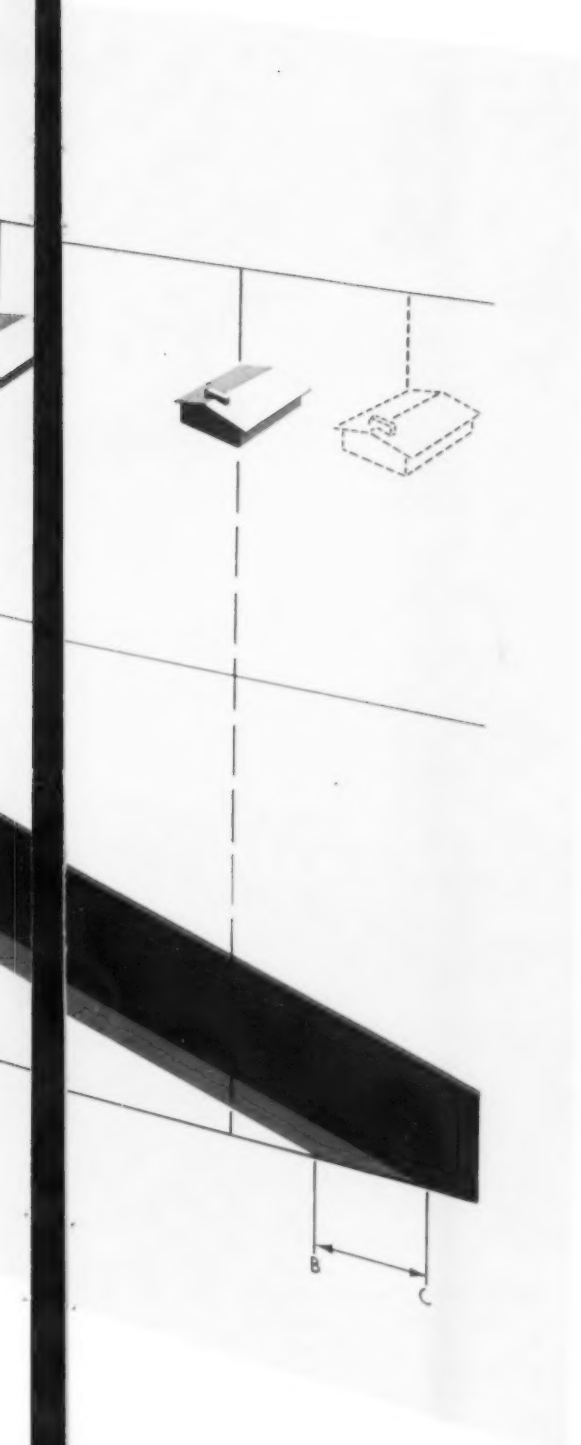
YOU CAN BE SURE...IF IT'S Westinghouse

**FROM SUBSTATION TO CUSTOMER . . .**
WESTINGHOUSE 1¼% STEP REGULATION MEANS FEWER VOLTAGE CORRECTIONS, FEWER REGULATORS, GREATER LOAD ON YOUR EXISTING FACILITIES




**"Here are the facts,"** says Roy L. Brown, Mgr. Voltage Regulator Engineering.

"At Point A—other regulators use more allowable voltage drop. Exposed orange bandwidth indicates the extra line drop available for load growth when using Westinghouse 1¼% regulation. Similarly, the distance B-C represents additional margin for load growth or line extension when using URL or URF Westinghouse regulators."




***It's a fact . . .***
***Westinghouse 1-1/4% step regulation***

# holds narrowest effective bandwidth, gives you more revenue

***Westinghouse 1-1/4% step regulation more effectively meets the three basic distribution voltage conditions — you gain a narrower effective bandwidth; permits heavier loads, less line equipment.***

Here is what Westinghouse new URL and URF step voltage regulators can do for you:

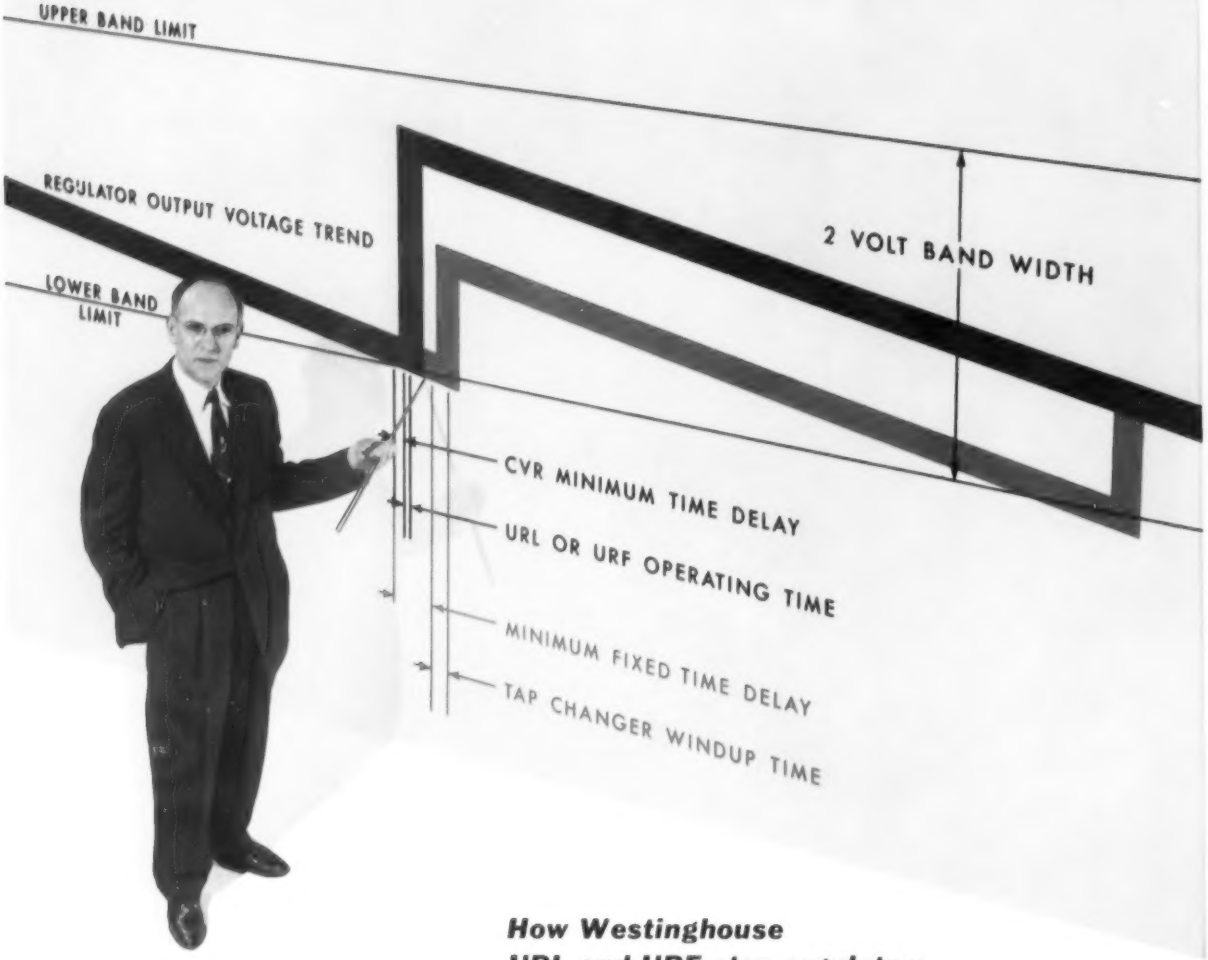
1. Save you money because satisfactory voltages can be furnished to loads farther out on the line.
2. Increase revenue by allowing heavier loading of existing lines, hold effective regulator voltage bandwidth closer to the limits set on the control.
3. Because of faster relay operation on large voltage changes and a tap changer that responds 15 times faster than other types of mechanisms, URL and URF regulators provide protection against runaway voltages which can damage user equipment.
4. Make possible a minimum total regulation equipment investment:
   (a) Longer lines
   (b) Fewer regulators
   (c) Deferred expansion to meet growing loads

YOU CAN BE SURE...IF IT'S Westinghouse

***This is system operating flexibility you get with no other regulators***

***HERE'S WHY . . .***

# PROOF!




***How Westinghouse URL and URF step regulators***

## meet all THREE basic voltage conditions more effectively

**SMOOTH VOLTAGE CHANGES**

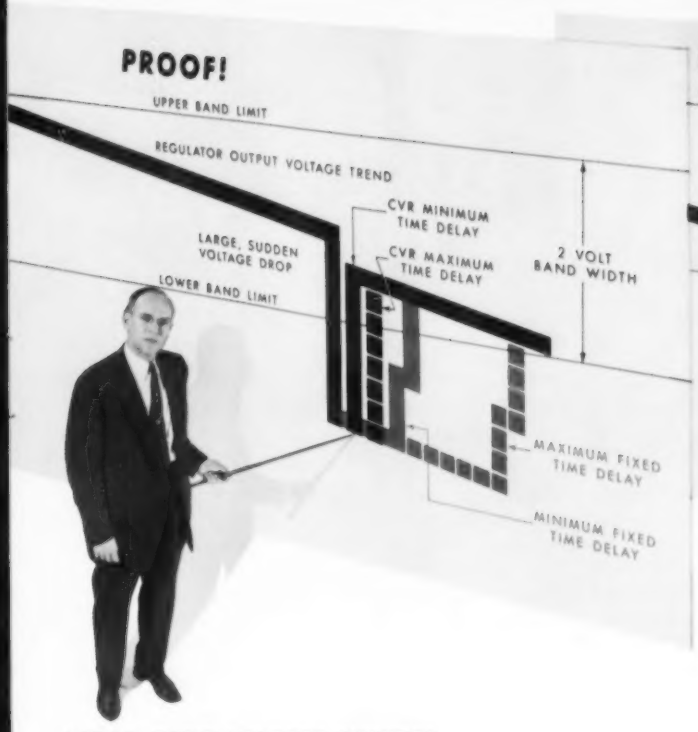
Fixed time delay on ordinary regulators allows voltage to go outside band limit before operation. The Westinghouse CVR induction disc relay "reads" voltage. When lower or upper band limit is reached, contacts close; instant-response tap changer corrects voltage 15 times faster than other tap changers.

**RESULT . . .**
**A NARROWER EFFECTIVE BANDWIDTH**

THE PURPOSE OF A REGULATOR is to maintain an effective voltage level which will provide top operating revenue consistent with the least possible equipment investment and minimum maintenance.

THREE EXCLUSIVE WESTINGHOUSE REGULATOR FEATURES give you this optimum voltage correction. (1) The unique new CVR voltage regulating relay with integral, adjustable, inverse time delay; (2) the instant-response tap changing mechanism, and (3) the 1¼% step giving regulation on a 120-volt base of 24 volts in 16 steps of 1½ volts each.

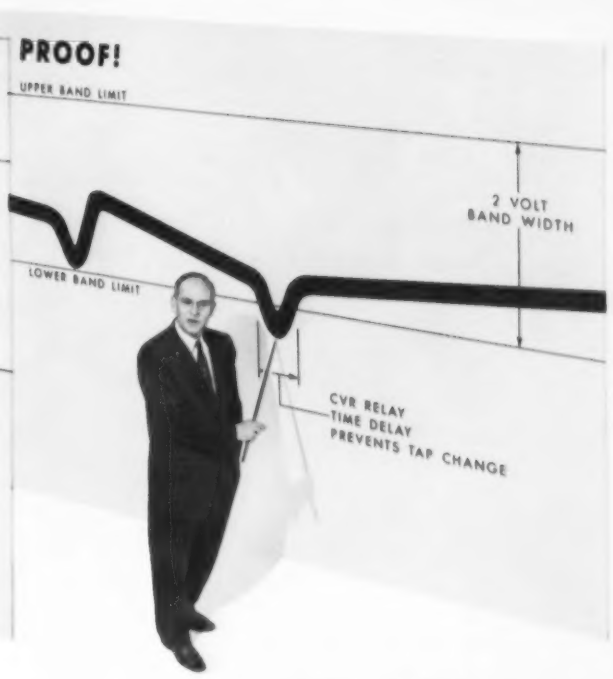
**YOU CAN BE SURE...IF IT'S**




**LARGE, RAPID VOLTAGE CHANGES**

CVR relay disc accelerates to close contacts and operate instant-response tap changer in a fraction of the time taken by other regulators. Because of the fixed time delay of ordinary regulators, steep voltage changes may run voltage so far above or below set band limits that two or more ¾-volt steps are required to bring voltage within the band. Westinghouse regulators, however, offer the quickest recovery under such voltage conditions.

**RESULT . . .**
**A NARROWER EFFECTIVE BANDWIDTH**




**IRREGULAR VOLTAGE CHANGES**

Westinghouse CVR relay induction disc with its damping magnet integrates voltage and time; its inverse time delay characteristic prevents relay and tap changer operation during self-correcting conditions.

**RESULT . . .**
**NO UNNECESSARY OPERATIONS**

***New CVR relay "reads" voltage, evaluates need for correction, eliminates unnecessary tap changes***

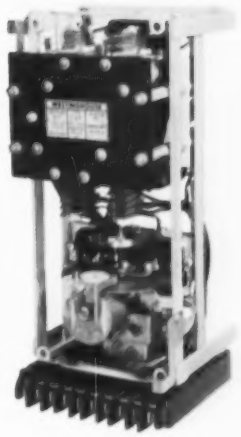
CVR voltage regulating relay is an induction disc device with built-in inverse time delay characteristics. On a smooth, slow-changing voltage (Figure 1), the disc position will follow the voltage, and will close contacts to start corrective action by the tap changer whenever voltage reaches pre-set band limits.

Ordinary regulators with fixed time delay allow wider voltage deviations from set limit.

But in the Westinghouse URL and URF regulators, the CVR relay operates immediately . . . voltage is restored to within band limits. Result—narrower *effective* bandwidth.

On large, rapid voltage changes, such as may result from switching in other parts of the system or from rapid load changes (Figure 2), the CVR relay disc *accelerates*—contacts are made, and again corrective action by the tap changer starts immediately. Voltage is quickly restored to normal. Result—narrower *effective* bandwidth.

Finally, irregular voltage changes (Figure 3), such as result from motor starting, are usually short-time, self-correcting disturbances. The Westinghouse CVR relay disc integrates voltages—automatically provides time delay through the averaging effect of the damping magnet. Prevents unnecessary operations which would lead only to increased maintenance.



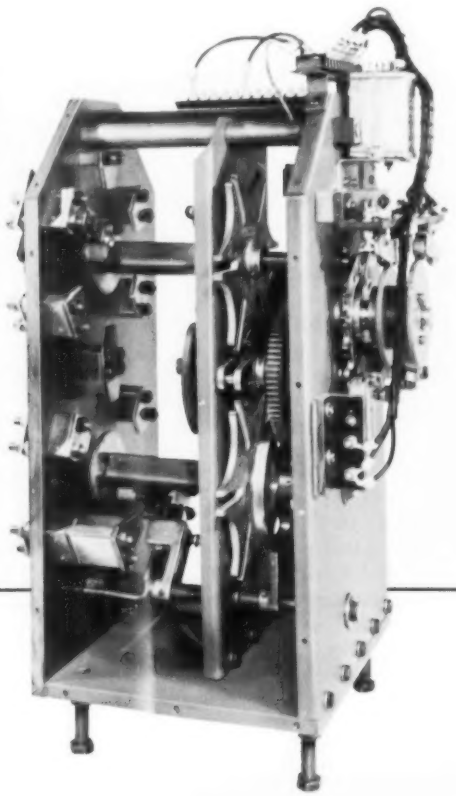
Unique new Westinghouse CVR relay with inverse time delay characteristics . . . provides best voltage regulation available under all voltage change conditions.

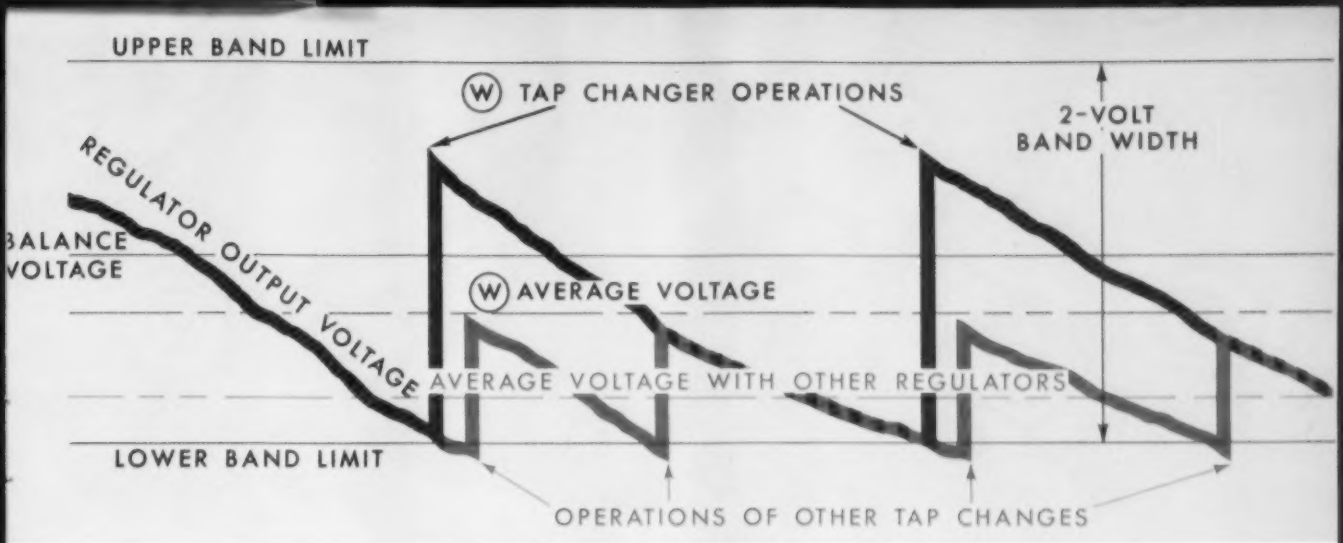
Westinghouse

# Instant-response tap changer corrects voltage . . . 15 times faster than other tap changers

***How Westinghouse direct-drive Geneva gear tap changer and CVR relay work together to achieve narrowest effective bandwidth***

The *direct-drive Geneva gear* tap-changing mechanism responds instantly to the command of the voltage regulating relay. As soon as the relay contacts close, the tap changer motor starts driving the Geneva pinion. No windup time is involved. The pinion engages the Geneva gear and immediately moves the tap changer contacts to the next position. The advantages of directly driving the Geneva gear are dramatically illustrated in a comparison of time required for Westinghouse regulators to traverse from maximum raise to maximum lower with that of other regulators. The directly driven Geneva gear can, if so directed by the CVR relay, operate the tap changer over full range in only 13 seconds. Other drives require 3½ to 5 minutes from maximum raise to maximum lower. The elimination of this unnecessary time delay further contributes to A NARROWER *EFFECTIVE* BANDWIDTH.






***Effective voltage of 16-step regulation is closer to balance voltage . . . with fewer operations***

When a 2-volt bandwidth is used, the voltage level will always be more than one volt from the balance voltage when the relay initiates a tap change. With its 1½-volt steps, the Westinghouse URL and URF tap changers will bring voltage back to the balance level with a single operation; whereas, a ¾-volt step regulator will never bring voltage back to this level.

***Westinghouse 16-step regulation means . . . 42% fewer operations, 15% less contact erosion. Result? Reduced maintenance, longer life***

***Optimum contact speed minimizes burning***

Contact speed and burning are directly related—excessive burning of contacts will occur with either too slow or too rapid contact break. The former delays arc extinction, the latter frequently causes flashover between stationary contacts. Exclusive Westinghouse direct-drive Geneva gear mechanism consistently assures optimum speed. Arc extinction is achieved at first current zero. Flashover is eliminated, burning minimized, contact life significantly lengthened.

***Contact burning and frequency of operation***

Contact burning or erosion does not increase directly as the size of the step; therefore, the contact burning for one 1½-volt step is less than for two ¾-volt steps. Tests have shown that, on the average, the 16-step tap changer makes 42% fewer operations than a 32-step tap changer, and that the 16-step contacts average 15% less erosion for the same service. These two factors make 16-step operation result in reduced maintenance and longer life.

YOU CAN BE SURE...IF IT'S Westinghouse

***Here is what new Westinghouse URL and URF regulators do for you:***

- Hold a narrower *effective* bandwidth
- Provide protection against runaway voltages which can damage user equipment
- Increase revenue by permitting heavier loading of existing lines
- Save you money because satisfactory voltages can be furnished to loads farther out on the line

ADD TO THIS THE WESTINGHOUSE LOAD RANGE SELECTOR . . . allows higher currents at reduced range operation. With LRS, you get increased capacity on all URL-URF regulators . . . 160% of rated current at plus or minus 5% regulation up to 400 amperes.

***Only Westinghouse offers these moneysaving product features:***

- Separate tap changer compartment
- Inverse time delay relay
- Direct-drive Geneva gear tap changing mechanism
- 42% fewer tap changer operations
- Longer life contacts
- Corrosion-resistant tank

Get more revenue for power delivered. Specify new Westinghouse URL-URF regulators on your system. J-70804

**YOU CAN BE SURE...IF IT'S Westinghouse**

Crowd of 365 viewed exhibits of 40 manufacturers at EMEA conference and learned from Dr. Grabbe to prepare because —

# Automation Needs Maintenance

Teams of experts were brought in succession before the 160 who attended the three-day conference of the Electrical Maintenance Engineers Assn. of Southern California, April 16-18, held in Founders Hall at University of Southern California, Los Angeles. Thus it differed from the third conference, held two years ago, in which parallel meetings of four panels were held simultaneously on three successive days. In this case 10 panel sessions on various phases of maintenance were presented in successive sessions by 29 speakers from industry.

The Conference panel sessions followed the opening banquet and table top exhibition by manufacturers and distributors. The banquet was held at Rodger Young auditorium and 356 were present to hear Dr. Eugene M. Grabbe, senior staff consultant on automation, Ramo-Wooldridge Corp., speak on "Automation in Industry."

Dr. Grabbe pointed out that electrical and electronic controls and computors are becoming increasingly a part of standard plant equipment. There are about 1,500 electronic computors in use today and within the next 10 years 100,000 workers will be engaged in the maintenance of electronic computors installed in plants throughout the nation. Future emphasis on automatic systems will be on the maintaining of this valuable tool and the technical skills of the electrical maintenance engineers will be forced to grow correspondingly to meet this challenging future.

Of special interest at the banquet meeting were the forty electrical exhibits presented by electrical manufacturers and distributors which included two outstanding mobile units of The Superior Electric Co. and the Electric Controller and Mfg. Co., Div. of Square D Company.

The conference was concluded with field trip studies as delegates attended field tours as guests of the Beckman Instruments, Inc., Fullerton, and the General Petroleum Corp. Building, Los Angeles.

The first session on "Planned Preventive Maintenance" was chairmanned by Frank Miller, Robertshaw Fulton. Speakers were Ken Shaw of Westinghouse Electric Corp. and Sam Schulman of Remington Rand Corp.

It was followed by a session on "Maintenance of Electrical Equipment", chairmanned by Dave Dehlinger of Larsen-Hogue Electric Co., assisted by Thurley Spydell of Lever Bros. and Phil Lord of U.S. Electrical Motors.

Curtis Stump of Mullenbach Co. was chairman, assisted by D. Trott of R. E. Cunningham & Son, and T. Regas of BullDog Electric Co. for the session on "Industrial Power Systems." "Load Studies & Power Factor Analysis," was led by W. C. King, Electric Machinery Mfg. Co. Speakers were F. V. Frey of the Pasadena Municipal Light and Power Dept., and Milton Brenner of Brenner-Fiedler & Associates.

"Lightning in a Nutshell", was headed by Frank Tharp, Floodlight & Fluorescent Maintenance Co. Assisting him was Joe Platt of Holophane Co. and Urban Beh, consulting lighting engineer.

"Commercial Buildings" discussion was headed by Bill Jones of Jones-Allen, electrical engineers. With him were Howard Hellman of Paul Hardeman, Inc., and Reginald Thomas, building engineer of the Edison Building.

"Small Plants and Their Problems" session was under Wm. McWaid of the American Radiator & Standard Sanitary Corp., assisted by F. Schultz of Fairbanks, Morse & Co., and Emerson Reichard of General Petroleum Corp.

"Maintenance of Electronic Equipment" was under Bob Marcum, Hughes Aircraft Co., and speakers were Bill Edmunds of Minneapolis-Honeywell, and James Ross of Ling Electronics, Inc. "Protective Devices" with King Christopher of Clark Controller Co. as chairman had Edmund Lanski of I-T-E Circuit Breaker Co. assisting.

The final conference session was "Electrical Codes and Safety Orders" under chairmanship of Ed Muller, State of California Division of Industrial Safety. Assisting him were Arthur Veit, L. A. County Division of Building & Safety, and James H. Teevan, Los Angeles City Dept. of Building & Safety.

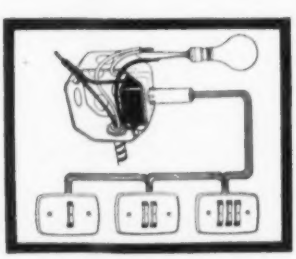
# I switched to REMCON

"My men do wiring jobs in half the time – now that I've switched to REMCON. Why? Part of the reason is because REMCON's 6-volt system eliminated the need for a switch box. All you have to do is nail up a plaster ring and you're ready to hook on your switches. It's easier for my men, and the time they save means 40% more profit for me. Even the Master Control which my builder-customers insist on, is simple to install. You bet I've switched to REMCON."

Carl G. Tiersch
Elmont Electric Co.
Massapequa, L. I., N. Y.

**HOW REMCON CUTS TIME –**

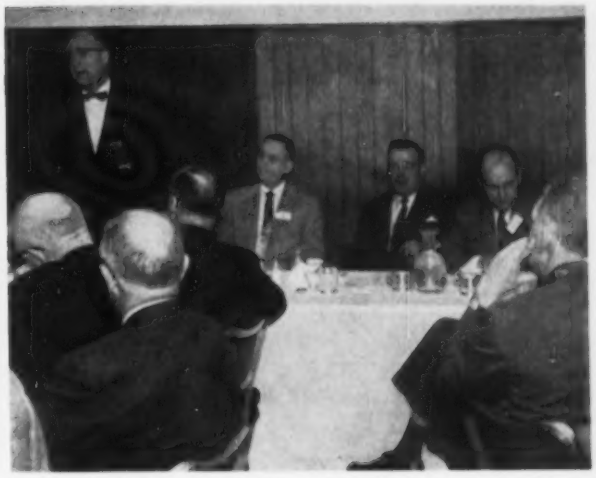
- Replaces armored cable on all switch legs with easy-to-handle and strip No. 18 wire.
- Most economical way of installing 3-way switches. Just match the 3 terminals of each switch to the 3 wires of each relay.
- Each relay is self-energized. So, it's simple to add as many switches as you wish to each relay.
- Simple to control many lights from one point, or control one light from many points.
- Silent . . . no click at the switch, no hum at the relay.



## WEST COAST REPRESENTATIVES

**Northwestern Agency, Portland & Seattle**
**Allied Industries, Los Angeles**
**F. M. Nicholas, San Francisco**

President Marshall Waterman speaks, C. M. Thompson, regional vice-president, presides at Los Angeles conference



School lighting standards will now be revised Charles Gibson tells special breakfast session after accord

### In Regional Conferences From Victoria to Los Angeles, Albuquerque

# IES Makes Path of Light

Ideas differ—West to East, North to South. And that's what makes a review of the three (and a half) IES regional conferences so interesting. Few but the principal speakers were privileged to attend all three. But all can read herein the appraisal of light (and dark) from the Victoria, Los Angeles, Albuquerque (and the half at Denver) conferences that began March 28 and ended April 24. Each region, its particular problems, the people attending, their differing views, the eastern experts and their views—all made for a dynamic kaleidoscope of lighting practice and theory today.

The Pacific Northwest regional conference of the Illuminating Engineering Society was held at the venerable and dignified Hotel Empress at Victoria, B. C., March 28-30, with Kenneth Reid of the city of Victoria, regional vice-president, presiding.

The South Pacific regional conference was held at Hotel Statler, Los Angeles, April 3-5. C. M. Thompson, San Diego Gas & Electric Co., regional vice-president, presided.

The Intermountain regional conference was held at the Alvarado Hotel, Albuquerque, N. M., April 11-12. Jerry Whitnell, Arizona Public Service Co., regional vice-president, was in charge.

The half conference referred to was a joint meeting of the Rocky Mountain Section, IES, with the Rocky Mountain Electrical League, April 24, at Hotel Shirley-Savoy in Denver. This full one-day session had all the aspects of a half-size regional conference although it was devoted to new developments in commercial and industrial outdoor lighting. It had been arranged by J. Hugh McCulloch, Independent Testing Laboratories, Boulder, Colo., chairman of the national progress committee, who with Scotch thrift combined a meeting of his national committee, the Rocky Mountain Section, IES, and the RMEL. It will be reported next month because of space limitations.

IES President Marshall Waterman of Westinghouse Lamp Division, Bloomfield, attended and addressed all four. Executive Secretary A. D. Hinckley, Technical Director C. L. Crouch and Ruby Redford, editor of *Illuminating Engineering* magazine, were national staff officers attending the regional conferences. E. B. Karnes, manager, outdoor lighting sales, Westinghouse Lighting Division, Cleveland, and Willard Allphin, illumination research engineer, Sylvania Electric Products Inc., Salem, spoke at all regional conferences. Charles N. Clark, General Electric Co., Nela Park, spoke twice at the Victoria meeting and Carl J. Allen, large lamp department of the same company, addressed both the Los Angeles and Albuquerque meetings.

"My Most Interesting Lighting Job" contests were an important feature at each of the three regional conferences. This year the contest was divided into two parts, one on residential installations, the other on commercial and industrial. Participation was had from more chapters and sections than any previous year, and hence more competition and interest.

#### President's Message

A third dimension in lighting—pleasantness—is needed as well as the much debated "quality and quantity," President Waterman in effect told each of the meetings, although his talk was individual and spontaneous in each. As is his duty as president, he outlined the programs of the society, especially emphasizing the meaning of the research program as a basis to back up with facts the designs and specifications prepared by illuminating engineers. The studies to determine the correct quantities of light needed and to control brightnesses to develop better quality should be combined, he said, with an understanding of color and psychology to create a pleasant luminous environment.

Ways in which the IES member remote from centers of the east can participate in the committee activities of the society were also discussed

Al Pryor shows huge parking area light proposal

Myerson, and speakers Jung, Sawyier and Schoen

by Waterman. He advised little groups to contribute ideas to the national committee, who would welcome help from all interested people. Another thing he stressed at each meeting was the need to interest students of engineering and architecture in illumination in order to develop future leaders of the society and to bring awareness of the importance of lighting both to engineers and architects. The allied arts activity wherein contests among architectural students are conducted by IES sections and chapters has been a valuable contribution to the profession.

Lest the engineers take themselves too seriously, they were gently kidded at the banquet at Albuquerque and the luncheon at Denver by William A. Cyr, consulting editor, Electrical West. He suggested some new research projects into dark to find out why it is so popular.

The distilled essence from each of the meetings is concentrated in the following reports.

### Lumber—And Schools Stir Debate at Victoria

School lighting, as usual, proved a provocative subject. After the customary preliminaries opened by Gordon Roper, B. C. Electric Co. Ltd., Victoria, conference chairman, the remainder of the morning was devoted to a talk by Willard Allphin, illumination research engineer of Sylvania Electric Products, Salem, Mass., which was followed by discussion that ran far into the noon period.

Based on the reappraisal of some of the maintenance factors proposed in IES standards, Allphin urged that the present factors be taken "with a grain of salt" and that designs should be made for the minimum instead of the average. Thus the school lighting standards with a recommended level of 30 f-c should be considered as a minimum and initial recommendatinos would call for perhaps 50 f-c. Some of this could include daylight through control. Researches indicate, however, that a full-size electric installation is needed even when extra daylighting is provided.

Recognition of the need for visual education aids, which require the classroom to be darkened easily and quickly, and the placing of desks or tables in all positions requires a flexible installation, he maintained. The discussion involved daylight control methods and the use of special units for the illumination of chalkboards, some being for them, others against.

The "My Most Interesting Lighting Job" contest was run off the first afternoon with a record number of entries, two in the class I, residential, and four in class II, commercial.

In the residential group, first prize winner was Jack Cottingham, lighting consultant, Portland General Electric Co., for the "Electri-Living Home" featuring a sunshine room. Second prize went to Basil McLaren, McLaren Electric Ltd., Vancouver, for lighting in his own home.

In the commercial class, B. T. Heinz, manufacturers' agent, Seattle, won first prize for "Design for Lighting Sales Laboratory." Second went to Walter L. Haspedis, Columbia Electric & Mfg. Co., Spokane, for a "Newspaper Pressroom." Third prize went to Don Statham, Pacific Power & Light Co., Coos Bay, Ore., for a presentation "Light for Seeing, Selling and Servicing." The fourth contestant, Paul Donnelly, Northern Electric Co. Ltd., Vancouver, was on the exterior and interior lighting of his church.

The Friday session began with a description of the lighting in the new B. C. Electric office building, Vancouver, some photos of which have appeared in Electrical West. M. A. Thomas, consulting engineer, and T. H. Doherty, B. C. Electric, combined in making this presentation.

The lumber industry is a very important economic factor in the entire Pacific Northwest. No wonder then that such interest centered in the sawmill lighting presentation by Prof. Dan Finch, University of California. Professor Finch, as chairman of an IES committee developing recommended practices for sawmill lighting, gave a review of the problem and a summary of some of the provisions in the standards.

Following Finch's paper, D. C. Gordon of B. C. Electric Co., Vancouver, assembled a panel consisting of T. W. Beadle, Washington Water Power Co., Spokane, Professor Finch, W. S. Gordon, consulting engineer, Tacoma, Stickney Harris, B. C. Electric Co., Victoria. They were bombarded with questions because of the seriousness of the need for illumination for safety and productivity under difficult lighting and wiring conditions.

The session concluded with a presentation by Charles N. Clark of General Electric Co., Nela Park, of pic-

E. B. Karns and Carl R. Albach

tures and results of a study on "Luminous Environment in the Home" conducted by A. W. Commery and presented in preliminary form at the South Pacific regional conference last year in San Francisco.

### Lighting History

The Saturday morning concluding session began appropriately with a history of the street lighting in Victoria, presented by Ken Reid, the electical engineer for the city, who accompanied his talk with a display of lighting fixtures used in street lighting in the past.

Also contrasting the past with the present, E. B. Karns of Westinghouse Electric Corp., Cleveland, opened his talk on "Recent Developments in Light Sources and Optical Systems for Roadway Lighting" (which he also presented at Los Angeles and Albuquerque) with some old-time photographs of the horse and buggy days. Particularly significant, in showing the new lighting equipment available, was a trend toward developing smaller mercury lamp units for residential streets where special treatment is needed.

Among the new devices shown were amber-colored mercury lamps for use as warning lights at railroad crossings and mercury units with visors for use near airports to reduce the number of visible light sources to incoming pilots, thus prevent confusion.

"Color in Light and Lighting," presented by Charles Clark, concluded the session.

Chapter and section chairmen took turns presiding over the various sessions. These included R. C. D. Jarvis of the Edmonton Chapter, Dr. Howard C. Hall of Puget Sound Section, Seattle, who presided over the "My Most Interesting Lighting Job" contest, George E. Romans of Inland Empire Chapter, Don Frost, Chinook Chapter, D. E. Seely the Oregon Section, and A. S. Harris, Vancouver Island Chapter. G. J. Roper, conference chairman, had on his staff W. G. McIntosh for papers and program, R. Parker finance, G. E. Douglas attendance and publicity, G. Langdon registration and reception, J. Morrison the lighting contest, J. Pye properties and electrical, A. Evans hotel, T. Emes transportation, G. Geddie entertainment, and Mrs. K. Reid headed the ladies' committee. Attendance was 216, including 139 delegates and 70 ladies.

### The Spectacular Appeals at Los Angeles Sessions

As one expects from Los Angeles, spectacular uses of light and some spectacular or outstanding lighting installations were the predominant currents that ran through the South Pacific regional technical conference April 3-5 at the Statler Hotel, itself somewhat spectacular. Appropriately, the message of welcome was given by Otto K. Olesen, now postmaster for Los Angeles, and the original user of giant searchlights for spectacular Hollywood previews, the lighting of the Hollywood Bowl and the Santa Claus Lane on Hollywood Boulevard. Olesen recalled some of these exploits.

Following the "My Most Interesting Lighting Job" contest Olesen's successor in the spectacular lighting business, Bill Todt concluded the afternoon session with a colorful and human account of how spectacular lighting effects are conceived and executed for world's fairs, big community celebrations like the California Story in San Diego and Hollywood. He likewise described the special job performed at the St. Louis Mid-America Jubilee last September.

There were six entries in the My Most Interesting Lighting Job contest, only one of which was in the residential class. This was presented by Albert Schramm, Coast Electric Co., Tijuana agent, for the lighting of the house of Mr. Rodriguez in Tijuana. He won uncontested first place. The winners in the commercial and industrial contest were: first place, Harold Shrahn of the lighting division, Department of Water & Power, Los Angeles, for the lighting of the Seventh Day Adventist Church; second prize to Warren Smith of Smith Electric Co., San Francisco, for the relighting of Shreve & Co., jewelry store; third prize went to George Smedberg, West Light Co., representing the San Jose Chapter, for the modernization of the lighting in the old

Max Flatow and C. L. Crouch

Fresno high school auditorium. Other contestants included Mel Fenton, Smoot-Holman representative in Sacramento, for the lighting of the low-level parking deck, and Arthur Collins of Graybar, San Diego, for the lighting of Dawson's Museum and Aquarium in Chula Vista.

### School Lighting

Agreement at last on school lighting standards seemed to have been reached, from the peaceful atmosphere prevailing at a special breakfast April 4, presided over by Jake Hochenauer, chairman of the Southern California Section. Just prior to the IES conference, the joint task committee of the IES, the AIA and the National Council for Schoolhouse Construction had held a meeting and some of the principals were brought to the IES breakfast for a report. On this panel were C. L. Crouch, technical director, IES; John Charlton of Toronto, a school executive, chairman of the IES school lighting committee; Foster Sampson, consulting engineer, representing the architects; Charles Gibson of the California Department of Schoolhouse Planning. E. M. Strong, past president of IES, attended but did not stay over. Other members of the committee named were Carl Allen of G-E, John Walsh of PG and E and Willard Allphin of Sylvania.

Lighting for production was pretty much the theme of the Thursday sessions over which Guy de Leuze, chairman, Northern California Section, presided in the morning and M. P. Fenton of the Mother Lode Chapter the afternoon.

Technical director Crouch based his talk on the question "Do we get increased production after we reach certain levels?" He then described the various researches being conducted, which might bring some

Roy Jones and Bill Shalda

Carl Allen, Guy deLeuze, C. L. Crouch

answers to the question. Many of these are on a highly technical level, yet he pointed the need also for consideration of motivation, challenge and psychological effect in respect to design.

"Visual Comfort in Illumination" was discussed next by Carl J. Allen of G-E Lamp Division. On a practical basis, he suggested analysis of completed jobs after they have been in operation to find out if the customers have been given comfortable seeing. This becomes more important as foot-candle levels are increasing. Upper limits may be found as well as minimums. He ended by describing experience in his own 450 f-c level lighted office.

There followed a short presentation of outstanding California lighting jobs, most of them industrial, and all with levels in the upper brackets.

Metwood Mfg. Corp., precision tool plant having 200 f-c in its shops and in its offices, was described by R. J. Schoen, secretary-treasurer. After installation, audits were taken to check the improvement. These showed rejects and reworks were reduced 32%, lost-time accidents were off 52% and employee turnover down 58%.

Another precision plant, that of Helipot Corp., owned by Beckman Instruments, at Newport Beach, making electronic components, was described by W. M. Semple of that company. A single reject on a product can cost several hundred dollars, hence levels of 180 f-c are a necessity and 400 f-c for the microscopes.

A departure from the industrial was made by Raymond A. Jung, architect for Felicita elementary school in Escondido. Use of the low-transmission glass in the windows brought the desirable effect of keeping all brightnesses within the recommended ratios but it required reliance entirely on electricity for illumination.

In contrast to this, in a sense, was the next presentation by Robert L. Sawyier, Pacific Gas and Electric Co., Oakland, who described the 150 f-c lighting installation in the Beckman Instrument Co., Berkeley, office. There a luminous ceiling had been installed. After telling of it, he asked for discussion, since he said that while from a visual standpoint it was a good lighting job there was something psychologically needed. The people in it feel that they "want to turn on some lights."

Common sense in the application of lighting equipment was advocated by J. Hugh McCulloch, Independent Testing Laboratories, Boulder, Colo. With numerous examples, he showed where some applications might be better off with shorter lamp life and more light output whereas others would require the reverse. Sheer reliance upon specifications rather than upon judgment could get a designer off the track as to what he was trying really to accomplish.

Along the same lines of sense, Willard Allphin, Sylvania Electric Products, Salem, discussed the uses and misuses of maintenance factors. It was essentially the same talk he gave at the Victoria meeting.

The Thursday sessions concluded with a dramatic presentation by Tom Warren of Ultra-Violet Products, San Gabriel. He spoke of the specialized field in spectacular lighting of black light and showed elaborate displays of objects, signs, pictures, etc., employing fluorescent paints or pigments upon which ultraviolet light was played.

The Friday sessions under Gordon S. Kimball, chairman of the San Diego Chapter, and George Smedberg, acting for George Baker, chairman of the San Jose Chapter, were on outdoor lighting and home lighting, respectively. E. B. Karns, Westinghouse Electric Corp., gave the same message he had given at the Victoria meeting (P. 169, column 1).

The versatility of the sealed-beam and reflector-type lamps in the floodlighting of buildings was illustrated and discussed by M. R. Gregory of Shalda Mfg. Co., Burbank.

How a presentation is made by Southern California Edison Co. to the developers of a big shopping area was rehearsed for the group by Al Pryor of that company. He used a large translucent display on which the recommended levels of lighting were shown by contrast and color.

New light sources and their best applications were then shown by Frank Lee of General Electric Co. Lamp Division, Los Angeles. Particularly stressed were the higher output fluorescent tubes such as the power groove, the reflector-type fluorescent lamp and the so-called bonus line of incandescent lamps of high wattage.

It was announced at the luncheon that the next regional conference would be held in San Diego and that the 1959 national technical conference would come to San Francisco.

A most delightful talk on color was given at the afternoon session by Ronald C. Allison, who is color consultant and designer for the Eatons stores in Canada.

Garden decoration with light was then discussed by W. H. Ritter of California Electric Power Co., Riverside. To make the garden an extra room for the house, he advised several basic tips.

Byron Payne of Arizona Public Service Co., Phoenix, in the press of time condensed his talk on home decoration with light to a few fundamentals as to the types of equipment available for built-in and portable lighting. He showed examples of troffers, structural elements, valances and coves.

Credit for the successful conference was accorded to C. M. Thompson, regional vice-president, San Diego Gas & Electric Co., G. A. Hochenauer, chairman, Southern California Section, now with Smoot-Holman Co., and General Chairman William Shalda of Burbank. Vice-chairman was Audie Ashcraft, Southern California Edison Co., and other committee chairmen were J. M. Russell, attendance; Don Prideaux, budget; Lloyd C. Reuscher, entertainment; Roy Bevan, finance; Hugh X. Sheeter, hotel; Mrs. Roy Kreyser, ladies; Roy Jones, papers and program; Bruce Corwin, publicity; Robert Ford, reception; W. P. Bear, registration; space arrangements, etc., Charles Connely; trans-

Vice-president Whitnell, Robert Uhl

Panelists Joseph, Schlegel, Dunn, Lopez and Bailey discuss design

portation, Benn J. Hartmann; sergeant - at - arms, Allison B. Clubley; and audio-visual aids, Sid Meyerson.

### Hi Cycle and Architectural Design Stirs Albuquerque

If you think of Albuquerque as Indians selling trinkets on the Santa Fe station platform it may come as a surprise to find it the place where the first high frequency, high voltage fluorescent lighting installation has been made in the West. It was natural, therefore, that high cycle, high voltage be one of the two major interests in the Inter Mountain Regional Conference of IES at the Alvarado Hotel in Albuquerqe April 11 and 12, presided over by Jerry Whitnell, regional vice-president, from Arizona Public Service Co., Phoenix.

The other center of interest developed spontaneously from the panel discussion on lighting design in which the divergent views of architect, consulting engineer, fixture designer and maintenance contractor were well brought to the surface. Some 100 men and many women attended.

Opened by Robert J. Uhl, chairman of the New Mexico Chapter and of the conference executive committee, the first morning session started with Brooks Chassaing, of Day-Brite company, chairman of the national membership committee, who made a report on the progress of membership drives in the society and outlined the advantages accruing to members which could be made the basis for soliciting more memberships.

That session also heard Willard Allphin discuss the use and misuse of maintenance factors, a talk similar to that given at the other two conferences. E. B. Karns, of Westinghouse Lighting Division, likewise, repeated his talk on developments in light sources and optical systems for roadway lighting.

Something very important in the Southwest where temperatures get high was the relation of lighting to air conditioning. Frank H. Bridgers, consulting engineer of Albuquerque, who, by the way, has the first solar heated commercial building, he claims, explained the heat dispersal problem. The air conditioning engineer and the illuminating engineer must understand each other's problems, he said, and told of the work of joint committees between the two societies.

President Waterman presented his presidential talk at the noon luncheon, over which George R. Gardner, past chairman of the New Mexico Chapter, presided.

High frequency lighting was the center of interest in the afternoon when John F. Gohring, chairman of the Arizona Section, presided. Carl J. Allen, of the Large Lamp Department, General Electric Co., Cleveland, described the reasoning back of the first 400-cycle, 600-v system at Union College Field House in New York state, and Carl R. Albach, consulting engineer of Santa Fe, N. M., told of the reason for selecting that system for the University of New Mexico gymnasium, then under construction. Unfortunately the construction stage had not reached a point where the members of the IES could make a field trip to the job as Albach had previously planned. He was co-chairman of the regional conference and, in the absence of Stanley Bazant Jr., he and Uhl and Robert Detzler can be credited with the management of all arrangements so successfully. (A complete article on the New Mexico University gymnasium will be featured in the September lighting issue, written by Carl Albach.

The afternoon concluded with the My Most Interesting Lighting Job Contest, for which Albert W. Boehning Jr., Albuquerque architect, was chairman. There were three contestants in the residential class and four in the commercial and industrial.

First prize in the residential class went to Gerald Joseph of Albuquerque for the ingenious "Do It Himself" kitchen relighting job with a luminous ceiling he had performed in his own home. Second prize went to William Stultz, Southern Colorado Chapter, for the fiesta lighting in the 11-room home of Ray Jermance in Canyon City. Les Waggoner, Arizona Section, describing the fabulous and complete lighting job in the residence of Don Willis home in Phoenix placed third.

In the commercial contest Robert Uhl, New Mexico Chapter, was awarded first prize for the lighting of the new telephone company office where a lift slab construction posed peculiar problems. Second prize went to Gordon McDonald, Rocky Mountain Section, Denver, for the lighting in the U. S. National Bank there. Third prize went to Don Roberts, Arizona Chapter, Phoenix, for the spectacular outdoor lighting of the Hotel Valley Ho at Scottsdale. A fourth contestant, Carl Balsac of Southern Colorado Chapter (presented by Les Johnson of Pueblo), described lighting the Holy Cross school in Canyon City.

Although the words were different, the ideas expressed by James Hugh McCulloch, Independent Testing Laboratories, Boulder, Colo., at both Los Angeles and Albuquerque were the same, namely, use commonsense along with fixture data.

In complete contrast Bill Shalda, Shalda Manufacturing Co. of Burbank, said that one pretty much "throws the book away" in the matter of garden and floodlighting. He

Willard Allphin and Robert Detzler

advocated that each one do a little experimenting of his own in his own yard, one fixture at a time and to play with it and see what effect he could achieve.

Parallel lines that never meet were revealed by the panel discussion whose theme was "Lighting Design as Viewed from a Number of Different Angles." F. A. Dunn, manager, G. E. Supply Co., Albuquerque, was an adroit moderator. The architect-engineer was Don P. Schlegel, assistant professor of architectural engineering at the University of New Mexico. The engineer was J. Joseph Lopez, partner of Robert Uhl as consulting engineers. Fixture designer was Lyle M. Bailey, vice-president, Albert Sechrist Co., Denver, and the maintenance contractor was Gerald Joseph of Lighting and Maintenance Co. locally.

Deploring advertising which presents lighting equipment as something other than what it is, Architect Schlegel set forth the abstract ideal that no design should bear false witness, that it must be truthful, that each material must be itself and not try to be something else. It was a matter of intellectual integrity, he felt.

Engineer Lopez recited the problem of the consulting engineer who must apply available materials to the abstract design of the architect and achieve the desirable function.

Fixture Design Representative Bailey appreciated today's ideal, that "form follows function" yet noted that architecture goes through periods every so often, such as the traditional, streamlined, so-called modernistic and now contemporary.

Supplier Dunn described his role. The supplier must not only have the materials for distribution but he must supply a great deal of information. He, likewise, has a moral responsibility to supply the quality material required but as to deciding the issue of morality of the design, he is not prepared.

Maintenance Man Joseph reminded that the factor overlooked by everyone is how the lighting installation is to be maintained. Few contractors, architects or engineers go back to see the customer after the job is done. It does not occur to the architect to call attention to the maintenance and relamping of the equipment that has been designed.

Design for a luminous and living environment was then taken up by C. L. Crouch in the afternoon session. He concentrated on designing for environments where work is to be done and not merchandising or recreation where a bolder or a more dramatic approach might be better. He then outlined the various researches being conducted by the society to gain a better appreciation of what will be most comfortable and beneficial in the way of a luminous environment for tasks in school, business or industry.

Thoroughness of IES research and the sincerity of its approach impressed the next speaker, Max Flatow, an architect who had come "loaded for bear" to question the foot-candle quantities being recommended by lighting people. What he really wanted, he said, was more service from the industry as to quality. The trouble with a handbook solution, he said, was that it depended on which handbook one was using. He felt encouraged by what the IES was doing in research which would aid architects to get the quality they seek. When competing on a quantity basis, he said, people were competing with a machine and could not win.

Fluorescent floodlighting and street lighting was next discussed by John Epperson, of San Francisco. He reviewed the first uses of fluorescent floodlighting at the World's Fair in San Francisco. Applications of fluorescent to floodlighting were far more appropriate in the Southwest, he said, where the temperature would permit the use of lamps in the open. He showed designs of equipment to utilize fluorescent lamps for street lighting and for service station and building lighting.

Use of many of the new devices in home lighting were described by Byron Payne, residential sales supervisor, Arizona Public Service Co., Phoenix. He showed methods of building-in lighting in residential applications, valances, coves could be used to provide satisfactory lighting and not clash with the decorator in his selection of drapes, wallpaper, etc. By changing the color of lamps a change of decor could also be achieved. He announced a new five-day home lighting workshop at Arizona State College at Tempe.

Concluding talk was on stage lighting. It was given by Gregg N. Cloos, manufacturers' representative of Denver. Stage lighting, he showed was a broad subject involving not only the theater but little theaters, community theaters, high schools, speakers' platforms, orchestras, choral groups, etc. The basic principle was to find out what the place was to be used for and then adapt the various pieces of equipment to the need. He showed many pictures of stage lighting equipment that is available and described its function and scope. He cautioned that light can sometimes steal the show and must not be allowed to do so in lighting a theatrical production.

The conference was closed by Vice-president Whitnell, who complimented the various committees for their arrangements. The conference chairman was Stanley Bazant Jr., with Carl R. Albach as vice-chairman, and the executive committee, headed by Whitnell, had Robert J. Uhl as chairman, Robert Detzler of Public Service Co. of New Mexico as vice-chairman, Robert King as honorary vice-chairman and Fred Dunn as secretary-treasurer. He also handled the finance. E. T. McGillan was in charge of registration and reception, Albach of papers and program, Joe Pearce of entertainment, Joseph Lopez of attendance and publicity, Albert Boehning the most interesting lighting job contest, Ted Douglass of hotel arrangements, Gerald Joseph decorations and LaVerne Knudtson the ladies committee.

The chairmen of the various sections and chapters took turns presiding: Leonard J. Carlon of Denver, Robert F. Even of Pueblo and Earl D. Peterson, secretary, Utah Section. The next conference, it was announced, would be in Pueblo early in May of 1958.

Space in this crowded convention issue being lacking the Denver meeting of IES and RMEL must await next issue. Likewise full articles will be run of some addresses later and amplification of the condensed accounts herein may be made in future articles. Some will appear as papers in the IES transactions. At least the compressed report here may serve as an index to the speakers and subjects.

Regional vice-presidents: W. P. Robbins, acting for District 8; W. R. Grasle, District 6; R. Goold, District 9

Speakers — Charles Moseley, Line Constructors; E. R. Cornish, research director; A. H. Gudie, Biddle Pub. Co.

# Manpower for Housepower

In a power packed conference — both man- and house- —three districts of National Electrical Contractors Assn. converged upon Portland in the power hungry Northwest for their annual joint meeting, May 20-22. Gathered there from Colorado, Wyoming, Montana, Idaho, Utah, Washington, Oregon, California, Nevada and Alaska came 130 officers and members from 19 chapters of Districts 6, 8 and 9. They came to check the voltage and current flow of their national programs and try to reduce the resistance to some of their most pressing needs— more and better trained manpower, and more and better business capacity and profit potential. They came to try to stop leakage to ground of some of their currents of business.

Both national officers and local spokesmen joined in a smooth running and high potential program prepared by host District 6 vice-president W. R. Grasle of Portland, aided by Phil Robbins, former vice-president and acting one for District 8 (in the absence of Ralph Johnson, Denver, in Europe), and R. Goold, Stockton, vice-president for the recently formed District 9. Host chapter, the Oregon-Columbia, under Larry Rodgers and his able staff, manned the job and supervised the arrangements with efficiency befitting a well run contract job.

National officers attending and participating were headed by Paul Geary, executive vice-president; E. R. Cornish, director of NECA research department; Charles Moseley, line construction vice-president; Bill Damon, director, national joint apprenticeship & training committee, and Matt Sherwood, technical editor, *Qualified Contractor*.

Most significant actions taken or ideas expressed included these:

1. **Endorsement,** after some debate, of the new proposed Federal Construction Contract Act, HR 7168.
2. **Resolution to private utilities** asking in the name of private enterprise that they submit to bid all work that lends itself to competitive bidding and to eliminate trick equipment clauses.
3. **Support of private enterprise** by endorsement of PG and E Co. in the Trinity River Project.
4. **Request for review** or approval of amendments to labor agreements by NECA for management as long as the union requires approval of its president to all changes.
5. **A full session devoted to line construction,** in which a fine program of apprenticeship training now being conducted was explained.
6. **Keen interest** in what may be accomplished by a joint industry board toward manpower training, business promotion and development.
7. **Although deploring and denouncing** direct sales and bad policy and practices of manufacturers and distributors a surprising appreciation of their problems and realization of contractor shortcomings in selling their product as well as bad practices of their own.
8. **More interest in the Housepower** program and through it of the potential market for electrical modernization of homes.

In addition there was a quick look at NECA's services supplied by the national and field staff and by its committee of contractors themselves. Two inspiring talks distinguished the two luncheons.

The first, presided over by J. A. McCoy, president of the Oregon-Columbia Chapter, opened the conference. Rabbi Julius J. Nodel of Portland, in an amusing comparison of fishing and golf commended the same dedication to the business and community life of contractors as they give to these sports.

A. H. "Bill" Gudie, president of Biddle Trade Publishing Co., once a contractor and NECA secretary himself, talked contractor language at the second luncheon when he urged them not to limit their horizons by poor management or policy or practices. Much of the unsound situation, he said, was because there was too much available business. "I do not mean to imply that every one of you has had too much business. But as a whole electrical contractors have had more business available to them than they have had facilities to perform efficiently." He included not alone physical equipment but trained personnel and most importantly, finances. Citing an example, "Any time a person so underfinanced can start in a business and do so large a volume in such a short time you have a business that is on a doubtful foundation." . . . "It is quite probable that a majority of the contractors everywhere are overextended with their wholesale suppliers. . . . When they do this it means that some wholesaler is further into the contracting business than he should be."

"If you had to limit your operations to the amount justified by the capital you have invested in your

Hosts—Larry Rodgers, Ore.-Columbia Chapter manager, and Wes Grasle v-p.

own business, by your physical facilities or by the personnel of your regular organization you would automatically recognize that the reduced volume would have to make all of your profit." With contractors standing on the threshold of a new era with new methods of construction they will need to be better businessmen. "Because your business will be bigger your customers will expect more business-like methods," he warned.

To assist contractors to become more efficient businessmen the technical and training services of NECA are offered as they are requested by the members, E. R. "Al" Cornish told the members. The importance of answering survey questionnaires the NECA sends out was illustrated by the resulting publications of the results. Among these are "How's Your Balance," the result of a survey of ratios of operating to office personnel against which any member can measure his own organization. Another answer to a long felt need was the result of a Building Institute workshop to develop better specifications and drawings and contract forms by which contractors may benefit from clearer bidding information.

A complete revision of Section H of the NECA labor manual has been issued as an aid to estimating residential modernization work to fit in with the Housepower program. Likewise new Housepower rating forms for members to use with NECA units. Cornish complimented members for better response to questionnaires and volunteering of labor data to make the manual a better, more representative instrument. As a member of the technical committee Phil Robbins supported Cornish with a strong plea for even greater cooperation in gathering of data. Also discussed was a proposed course on engineering and layout of electrical work because the contractor is often called upon for this service.

The other services of NECA were reviewed at the opening meeting by Paul Geary. He expressed disappointment at the slow growth in membership (now 3747) with an eligible 8,000 more who do 36% of the total volume, NECA members doing 64%. He advocated better coordination of national and local activities, better understanding of their respective fields, more effort toward occupying of the entire field of electrical construction by NECA members.

Geary also discussed two controversial issues – the empowering of NECA to establish branches in areas not covered by chapters or to supplement chapters where membership is too limited – and the proposed HR-7165, the changed Federal Construction Practice Act. He was able to satisfy the questioners of details enough to permit a resolution in support of the bill to be passed later in the meeting. J. D. O'Connor of Sacramento also talked on this proposed legislation.

Also covered by Geary were proposed changes to the pension benefit agreement to broaden the coverage without increasing contractor assessment; investment of benefit funds in housing for army and air force personnel families; efforts to gain acceptance of chapter dues as a cost in government contracts; changes proposed to the Taft-Hartley act to legalize multi-employer bargaining done in the construction industry, another system for certification in such industries without elections and legalization of joint boards for apprenticeship.

Later Geary urged more reporting by chapters on the manpower situation on the area marketing and employment survey forms would assist NECA and its members to be aware of how much work in all areas was being done by members and by non-members.

### Housepower

Experience has shown that the selling of a rewiring job will bring about an average of 100% increase in the use of electricity in the home, the contractors were told by Bill Tait, appliance sales promotion manager for Portland General Electric Co. He used this as an illustration of the tremendous potential awaiting the contractor who will apply selling to his development of new business.

The potential market is undergoing constant change, which is in turn governed by such things as productive ability of the salary earner, family income, discretionary spending power, birth rate increase, the age make-up or distribution of the population, the women wage earners and the obsolescence of homes.

To inspire contractors to think about tapping this potential market, Tait pointed out that today's middle income group has six times the purchasing power of the same group in 1940-41.

Selling such an "intangible" as rewiring is not easy, Tait pointed out, any more than electricity is easy to sell. "All industry has watched the development of the Live Better . . . *Electrically* and Housepower promotions. One by one the various industry segments are getting onto the bandwagon and the two joint efforts are beginning to do the job for which they were developed.

For the labor relations session Oscar Harbak, IBEW District 9 vice-president, scheduled, could not be at the meeting. In his stead, W. L. Vinson, business manager, local 125, addressed the group. Lee Anderson, vice-president of District 8, from Pocatello, was present and spoke briefly in respect to presidential approval of all amendments to labor agreements. At that time he explained that such review and approval was necessary to keep illegal clauses from labor agreements.

Vinson stressed the idea that contractors too often neglect to give any time or thought to the human relations aspect of their dealing with their employees. Negotiations are conducted around the dollar sign without attention to the feelings and needs of the men themselves. Utility companies have done far more in presonnel relations than contractors, he said, although they employ less union members than the contracting business. Too often, he said, a contractor assembles a group of people and throws them together indiscriminately.

What may be accomplished through the combined efforts of a joint industry board was described by George Harter, Santa Clara-San Benito Chapter manager. (See ELECTRICAL WEST, May 1957, p. 109.) He made no effort to cover the law, techniques of operation or possible abuses of such a system. Some of these aspects were argued in the discussion session that followed.

Legal booby traps in contracts was a subject of intense interest at the beginning of the closing session before the conference went on a bus trip to view the Bonneville power

plant and Columbia River highway scenery. The speaker was the Oregon-Columbia Chapter's attorney, William Lubersky.

Most legal problems arise, he said from experience, over payment of money and when it is due. He analyzed a common contract and showed where questions might arise. In doing so he emphasized over and over the necessity of careful reading of the contract and of agreeing to any changes only in writing. He advised reading of the contract not only by the contractor and his staff but by the foreman on the job, with a strict rule that every change order be in writing and signed. The same advice went as to delay authorizations. "Knowing you are right in a dispute," he said, "is one thing; having proof is another."

Lubersky advised writing plenty of letters to keep a complete record that can be checked back upon and to have reliable witnesses who will be around later when and if litigation is started. Under the Miller Act, he cautioned, a prime contractor is responsible for wages and expenses of subcontractors. His advice, "Buy a bond." In accepting a contract he urged that a contractor should insist it be put in writing when the subcontractor is to be paid, the terms arranged and the meaning of any clauses that may be ambiguous.

"The only way you can make money is in doing the work, not in the courtroom," he concluded.

Each district held a separate breakfast meeting for members of the district. At the same time the line constructors held a full morning meeting.

### Line Constructors

Six of eight planned regional chapters of line constructors are now formed, Charles Moseley, vice-president of NECA's line constuction organization told members. Of the six chapters, Moseley said the Northwest Line Constructors group is the one best off in terms of financial stability, membership and jurisdiction.

Many problems of the nationwide organization stem from widely varying local conditions such as wage differentials between utilities, line construction contractors and "inside" or "commercial outside" contractors.

The Northwest group is in a healthy condition because (1) wage rates are competitive with utilities, (2) the Northwest chapter has a continuing agreement with four locals of IBEW that is area-wide and covers wages and working conditions, and (3) one of the conditions in the IBEW agreement is that *all* outside work belongs to line constructors. There is no "commercial outside" activity as in some other areas, where the inside contractor can do certain classes of outside construction.

Apprenticeship training of future journeyman linemen received the close attention of the line constructors. Again, the Northwest group was called the leader of the national organization's program. Bill Damon, director of NECA's national joint apprenticeship and training program, said: "Northwest is so far ahead of the rest of the country that there is no comparison."

In fact, the training program that is now offered to all line constructor chapters was authored by Northwest NECA and IBEW members. It is currently being put to use in the Northwest though some details still need working out.

Director of Northwest's line constructors apprenticeship and training program is Douglas G. Ellis. He explained that the line constructors found themselves with only about 20% of their work force in jobs or classifications that could be called "skilled" as World War II came to an end. Most of these were not well-rounded in experience, but instead were men who reached status as journeymen through one specialty. Problems were further increased as many desirable employees turned to the utility companies for security, further training and experience. The solution for line constructors to use is to join with IBEW in training apprentices for the contractors' work force.

R. Goold, District 9 vice-president and Bill Damon, dir., joint apprenticeship

W. L. Vinson, business manager of Local Union 125, IBEW, told of some of the special problems found in dealing with the people in the contractors' work force.

One of the serious problems stems from the fact that line construction personnel tend to be wanderers, partly by choice, partly because the nature of the work requires it. The training program had to be standardized so the apprentices could take credits achieved from one area to another as work required them to move. He said it is hoped that all-around development of several skills instead of a specialty will help to stabilize the men; give them more constant employment in an area of the worker's choice.

One of the most serious obstacles to the apprenticeship recruiting is that men have lost—or never formed—study habits, and find the training difficult. Vinson illustrated this with the statement of the wife of an apprentice:

"I'll be glad when he gets through with this course. It wasn't much worse when he quit smoking."

Vinson said the training program is facing the problems encountered in changing the way of life of a large segment of IBEW membership. Its importance was emphasized by Damon, who said:

"Apprenticeship is the lifeline of the electrical industry."

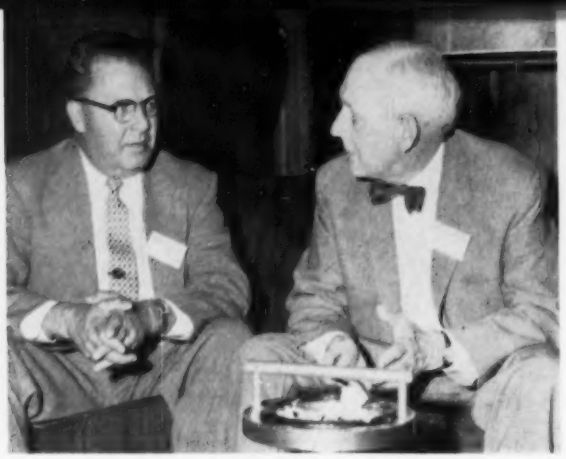
Discussions in the line constructors' session was under the direction of E. B. Sargent, president of Northwest Line Constructors.

## Resolution to Utility Companies

**BE IT THEREFORE RESOLVED, That every private power company not so now doing be requested to adopt a contract policy that it shall submit to bid any proposed construction that lends itself to competitive bidding, and that it shall refrain from including in its specifications requirements for the use of "patented articles" such as machinery available only to the utility itself or to one contractor; and that the results of such bids be made known to all bidders; and**

**BE IT FURTHER RESOLVED, That this Tri-District Meeting, while still supporting the basic principle of free enterprise, favors legislation at local or national level to insure that private power companies operate within the true intent of that same system and in the best interests of the public they serve.**

NECA's Paul Geary, executive v-p. and Joe Bollinger



Dex Jewett, field representative; Chas. Wikle

### District Meetings

One purpose of a district's own meeting is to exchange information respecting wage and other labor agreement changes. The District 6 group were informed of settlements of negotiations in Bremerton and Tacoma, of the demands being made in Seattle, Bellingham, Shelton and Aberdeen. Portland had settled in January. Spokane has a year to run on its present two-year agreement. Alaska had settled for a raise to $4.80 per hour in the smallest demand in history. Cases had been taken to the Council on Industrial Relations by Pasco and Wenatchee. Some of the extravagant fringes and special classifications being asked for by some locals were likewise discussed.

The District voted its preference for Las Vegas as the site for the 1959 national convention. A vote of commendation was unanimous for the work of Cornish and the technical and training committee for its outstanding service to the industry.

A discussion of telephone book yellow page listings showed disapproval of the attempt to increase the number of listings for contractors.

At the District 8 breakfast after the review of wage and labor conditions in various areas the subject of greatest interest was the Montana Power Co. plan of contractor-utility-bank coordination to bring business from the Housepower program. (This program will be described in detail in another issue.)

District 9's meeting was the largest and crowded more into its agenda. Being combined with the California-Nevada Conference of chapters Aug. 15-16 at Santa Rosa was set for the next meeting in order to consider NECA constitutional amendments pending. Fresno and Los Angeles invited the three districts for next year's conference and Fresno won the vote.

Ernest Kramm, Northern California Chapter manager, who represents the chapters on the Construction Industry Legislative Council at Sacramento, reported on proposed legislation being watched. He later asked whether legislation was desired to require electrical inspection on schools and other public buildings now exempted. In some localities inspections departments do inspect schools at school board request but in others none is permitted. The state department of architecture was said to be lacking in inspector personnel with which to do the job. A committee was appointed to meet with that department in the interest of adequate inspection.

By coincidence moves to bring architects, engineers and designers together with contractors to seek to get better specifications and electrical plans were told by several chapters. Similar action was told about by Cornish at the national level later. Harter told of an estimators report card furnished estimators on which to note defects in plans or specifications and mailed to the architect or engineer to request clarification.

Competition from the telephone company brought to light a surprise development. The telephone utility was said to be installing control circuits in industrial plants as it does telephone circuits, with open wiring at 70 v, d-c.

Harter also presented some ideas for setting up an area construction industry wage stabilization program based on studies of economic conditions in the area. These studies would be a guide to negotiating committees in determining whether wage increases could be justified.

Warren Penn told of a suit instituted by the Los Angeles Chapter against the operating engineers union over jurisdiction in the handling of materials that have always been handled by IBEW.

Enthusiastic tribute was paid to the members of the Oregon-Columbia Chapter, every one of whom carried some responsibility in playing host to what was perhaps the most successful tri-district annual conference. It was certainly a spectacular step in advance of the first District 6 meeting held in Portland about 10 years ago.

Harris Steel, Denver and F. W. Fitch, Cheyenne, represented Rocky Mountain

John Majerus, manager, Oscar Olson, pres. of Puget Sound Chapter, Seattle

ELECTRICAL WEST

# Contractors' News Letter

QUICK NEWS ON TRENDS, LAWS, CODES, MATERIALS, EQUIPMENT, COSTS, WAGES, ETC.

**Rush is on**

If business maintains the pace that conventions and meetings set during the last two months, or that was promised by speakers at them, the booms of yesteryear will be as nothing to what we haven't seen yet. Business is picking up in construction and one wise old contractor in an area where vacations are in the contract warns his fellows that manpower will take to the beaches just when that job should be finished.

**Paper work**

Likewise not to forget that new wage scales, fringes and payroll reports to Uncle and association can complicate things pretty well confused already. Some of the demands made in negotiations still pending make one wonder whatever became of the hardboiled electrician, the new generation seems to be such bottle-fed babes.

**Press the codesters**

New formula for demand load in residences, proposed by Spokane's chief inspector, James Paxton, (see p. 151) at the Northwest Electric Light & Power Assn. meeting in Vancouver, was taken by a delegation to the Electrical Section of NFPA at its Los Angeles convention, May 20. Formula: Demand to be calculated as the sum of 11 kw + 35% (connected load—11 kw). NECode demand now calls for 75% of fixed appliance demand.

**Look them over**

Electrical Inspections and Inspectors were under the microscope of Peter J. Hicks, of Providence and L. O. Trim of Burbank, inspectors; E. R. Cornish of NECA; H. H. Watson of G-E for manufacturers; and Leon Dame, So. Calif. Edison Co. for utilities at the NFPA Electrical Section convention, under M. M. Brandon of Underwriters as chairman. Inspectors, a hardy lot, will survive.

**Predigested**

Nobody but fool editors could attend and take in all the flood of information really pertinent to the business that came from all the conventions reported in this issue. But the editors have done a digest job for you that saves you hours of sitting and listening, not to mention travel expense. It is a treasure chest of news and ideas, of market opportunities right now or soon to come. Read it all and pick up what you can use. For more information, call or write. There's lots more for which we did not have room to tell all.

**Spread inland**

It is "Intermountain" Chapter now instead of Utah-Idaho, for at a big membership meeting in Salt Lake City on April 13, the NECA members authorized addition of the Grand Junction area in Colorado to the chapter and a new name, changes in bylaws and a bright new program. Space in this issue lacking, watch for an account of it in next months issue, late but still important.

**Last job**

Claude Detweiler and John Dewey his line construction manager crashed to their death near Casper, Wyo., when flying in a storm to what was to have been their last line job. Claude Detweiler and his brother have been Twin Falls' most prominent electrical contractors and of recent years have constructed many pole lines in Montana and Wyoming as well as in Idaho but were planning to retire from that business.

**Specify the Spec's**

To make plans and specifications mean what they mean a technical advisory committee of the construction industry has been working. The Peninsula Electrical Contractors Assn. asked architects and engineers of the area to check over the proposed national committee code with them. Seven meetings have been held and there is hope that all will someday be talking the same language.

**Coin money**

Bigger and better note—A new electric sign on The Mint in Las Vegas will have a connected load of 300 kw—the most.

**A switch**

Sued by a general contractor because though low bidder it refused to sign a contract, Dirks Electric Co. was sustained in Berkeley municipal court. Dirks had given notice before the purchase order had arrived.

**Silver anniversary**

Vancouver Electrical Assn. in B. C. elected E. Van Balkom president to succeed S. C. Murkin; Norman Beach, vice-president; F. Moore, secretary and T.Butler, treasurer. The 25th anniversary of this contractor organization was celebrated May 1. W. C. Mainwaring, who had helped found the association, was guest speaker; Dick Hall long active with it, now its PR officer, had charge.

**Sues union for pickets**

A million dollars in damages is claimed by the Los Angeles Chapter, NECA in its suit against the Operating Engineers union of five locals for picketing electrical jobs and interfering with performance of members' contracts with the IBEW regarding the handling of equipment and materials. The operating engineers took their case to the AFL-CIO jurisdictional board in Washington and were awarded jurisdiction. The NECA claims that this violates contracts over which the board has no authority.

**Demises**

Folded – – Two Northwest wholesalers, Central Supply Co. in Portland and Peerless Electric in Seattle. The latter has been reorganized and continues to operate with new officers, E. C. Curtis, president, M. G. Crooke, secretary treasurer and Mike Murphy, vice-president, a group from the building supply business. . . In Salt Lake City Bush Sales & Service, a motor shop, quit.

**Expansions**

Among contractors – – Pacific Electric Motor Co. of Oakland has established a branch at 610 West 10th St., Pittsburg, Calif. with P. C. Jacobson in charge. . . Ed Pierce Electric Co. of Vallejo is being divided into its separate appliance and wiring businesses. Harold Pierce now owns and operates Hal Pierce Electric, the wiring business, his brother Ed Jr. the Ed Pierce Appliance Co.

. . . Bert Stiles, one of Denver's old timers has sold an interest in his business to Commonwealth Electric of Omaha, Lincoln and Kansas City. It becomes the Commonwealth-Stiles Electric Co., with Bert as secretary-treasurer. . . Crockett Electric Shop, Crockett, Calif., has been acquired from its owner Jack Cummings by T. L. Rosenberg Co., of Oakland, owned by Leon Hampton of Oakland and Longview. It will be known as the Crockett Electric division of T. L. Rosenberg Co. and its scope diversified into commercial and industrial in addition to its former residential field. Cummings will remain, semi-retired, as a representative.

**Memento**

Shorty Reitz of Las Vegas, Nev., was honored recently by Nevada Chapter, NECA at its installation of officers. He was presented a silver plaque in honor of his many years service to the chapter as its governor and president.

**Returns to NECA**

Ray Carey, formerly manager of the Northern California Chapter, NECA, in Oakland, has joined Warren Penn as an assistant in the Los Angeles Chapter, handling labor negotiations and similar matters. Don Boyer, who formerly had this position, went east recently with Kaiser Aluminum.

**Training starts**

A linemen's apprentice program, long in preparation, is starting now in Portland and Seattle under a joint sponsorship of the Northwest Line Constructors Chapter, NECA, and four locals of IBEW. Douglas G. Ellis, formerly assistant director of the Oregon State apprenticeship program was made director of the new program. Story soon.

**Shareholders**

Employee ownership, again 100%, is credited by Norman Ferguson, president of California Electric Works, San Diego, for record business last year as well as pride of ownership, better workmanship and sales. See story next month.

**Changes**

Columbia Electric of Spokane has had some changes lately. Artie Clark, consulting electrical engineer formerly associated with Lou Gawan in Salt Lake City has become Columbia representative in that area, succeeding Robert Cooper who was transferred to Spokane. Ray Hankins who had represented Columbia at Denver has resigned. His successor was not learned at press time.

**Higher voltage**

480-v secondary distribution, possibly underground, is being considered seriously by Southern Nevada Power Co. for service to a new tract of homes. This company, whose domestic customers use more electricity than any in the nation will thus serve air conditioning and heat pumps at 480-v, use dry-type transformers for lights and other appliances.

**Tribute to hard work**

Two faithful secretaries of electrical inspector association chapters were honored at recent meetings. Clare Alger, who served the Puget Sound Chapter, IAEI, as secretary for many years, was given a cash gift by all members of that chapter at its meeting in Bellevue. Ed Muller, upon his retirement as secretary-treasurer of the Southern California chapter, was presented a set of matching luggage by members at the Pasadena meeting.

**Join forces**

Delta Electric Co. and Cliff Allen Electric Co. have combined forces as the Delta-Cliff Allen Electric Co. Inc. at 3221 Union Pacific Ave., Los Angeles. Cliff Allen is president and Julian B. Davis is secretary-treasurer and engineer.

**Specialist**

Urban Beh, who for 30 years was lighting engineer with General Electric Co. in Los Angeles, has set up his own consulting lighting engineering practice at 2701 Circle Drive, Newport Beach, Calif.

**Easier to install**

Max-Cool Prefabricated Air Conditioning duct kits will enable contractors to install duct work easier in housing developments. They are made by Mitchell Mfg. Co. in kits of components of embossed aluminum covered with fiber glass that can be assembled in various combinations.

**Lamps but no light**

A hard time finding lamps and home lighting equipment for PG&E's television commercials experienced by John Walsh, commercial manager, who supervised the lighting details of the TV films made by a Hollywood producer. If John Walsh has trouble finding them, what about the poor consumer?

**Expands again**

Incandescent Electric Supply Co. has a new 20,000-sq-ft single-floor building under construction for its San Jose branch. Marvin Jankelson hopes to have it opened by June 15. It will house office, showroom and warehouse for the branch and have 20,000 sq ft of parking area for staff and customers at Commercial Street near Seventh. The company only recently opened a new building in Sacramento. Jankelson announced new changes as a result. Tom Garvey became new manager at Sacramento as of April 8, transferred from Fresno as products manager. Vern Swanson became assistant and office manager there. Herb Williamson was added to the staff in charge of government accounts.

**Some changes**

Among people—Frank A. Sieka, general manager and vice-president of Valley Electric Co., Sacramento distributor, retired after 35 years with the firm. He is succeeded by Jack Watts. Lyle Barber becomes purchasing agent. . . . Chris Klawa, formerly inspector for the city of Portland, has joined the staff of William Volheye, Oregon state electrical inspector, and will replace O. W. Newton upon retirement. . . . Aubrey E. Rummell has succeeded Edward Strout as secretary-manager of the West Texas-New Mexico NECA Chapter, Carlsbad, N. M. W. J. Budwine, Service Electric Co., of Carlsbad, was recently elected president, and C. M. Anderson of American Electric Co., Lubbock, Tex., the governor of that chapter. . . . Roy Bevan of Sylvania was appointed to the board of managers of the Southern California Section, IES, to fill the vacancy of vice-chairman when Merle Potter moved to Lancaster. Audie Ashcraft was selected as secretary-treasurer. . . . Ed Frunhoff and Norm Cohen have established as consulting engineers at 7024 Melrose Blvd., Los Angeles. . . . S. K. Given joined the staff of J. S. Hamel, consulting electrical engineer in Burbank.

**. . . and additions**

Smoot-Holman Co., Inglewood, has recently added two sales engineers to its staff—Robert Waddell, formerly with Sylvania, and Harry Shearin, formerly with C. W. Cole Co. and previous to that with Southern California Edison. Soon afterward, Jake Hockenauer, formerly of Benjamin, also joined the staff and Jim McCormick also.

**Holds that service**

Coast Electric & Mfg. Co. of Portland has developed what it calls the "Snuggle Bar" for clamping and mounting service conduit for 200-amp services, now common in the Northwest. The steel channel is shaped to fit between studs. It has a number of holes through which a U-bolt can be used to clamp the conduit. It is made either for surface mounted conduit or for recessed mounting.

**For shallow fixtures**

Leadlight Fixture Co. of Oakland announces a new Fine-Line Concentric Design of plastic vinyl diffusing panels for its 3-in. shallow Spacelighter units, as well as a new honeycomb low brightness Louver Diffuser. . . . Price increases because of increased labor and material costs of 5% across the board were also announced for the entire line.

**Back to the cave**

So you thought gas lighting was dead? In Arizona, where they're experimenting with sun power for electricity, gas is trying to make a comeback. In imitation of the coal-oil torches used to give jungle atmosphere in Hawaii, swimming pools are being bordered with gas torches and one hopeful manufacturer has brought in some gas lanterns for mounting on posts as garden lighting. If electricity can't repel that nostalgic invasion, the land had better be given back to the Indians!

Three northern California chapters at Underwriters' Lab.

Utah Chapter annual meeting was held at Salt Lake City

# Inspectors Bloom in the Spring

Spring is the time of year when many chapters of International Association of Electrical Inspectors hold their annual meetings. Sometimes it is the only meeting of the year. Of course others hold either monthly or bi-monthly meetings. The trick is to coordinate these meetings into a sequence of dates so that a fast trip can be made by someone from the IAEI main office in Chicago. Thus he can fulfill the desire of all chapters to have this attention paid to them at least once a year.

This year they didn't quite make it. Everett Cogan, assistant technical secretary, Chicago, did his best and did make it to five (really seven because one was a joint meeting of three chapters) in one trip; three another, but that left others disappointed.

IAEI President Harold Morr of Salt Lake City, who doubles this year as Northwest Section president, also did his best to fill in a couple of gaps. Where he did, he made a strong appeal for understanding of the difficulties this desire for head office attention involves. Tremendous distances to cover and so many chapters to coordinate as to meeting dates, plus the expense involved, makes it not only rough on the traveling head office man, and expensive for the association which isn't too flush anyway, but it takes him out of the main office for such a long time that the increasing load of questions on code matters and association details piles up and delays service to members.

From the type of code problems brought up at these meetings, however, head office staff and officers learn of regional differences in practice, methods of wiring used or preferred, climatic or other conditions peculiar to the area. All of this contributes to making the National Electrical Code truly a national code but it also brings forth the need for certain compromises in order to do so.

No report has been received from the Southern California Chapter meeting held in San Diego at the beginning of Cogan's first tour, March 24.

Three chapters in northern California hastily called a joint meeting March 29 at the Underwriters' Laboratories in Santa Clara. It was attended by 82 from the Northern California Chapter, the Sacramento Valley Chapter and the Central California Chapter, and presided over by Creighton Schwan, chairman of the Northern California Chapter. Lester Woldit, acting chairman, and Clarence Jarvis, secretary-treasurer of the Sacramento Valley Chapter, sat at the head table. Charles Pierce, chairman, and Clyde Smith, secretary-treasurer of the Central California Chapter, arrived soon after the meeting was called. Likewise in attendance were Frank Jones of Phoenix, president of the Southwestern Section, and Lou LaFehr, secretary-treasurer, from Alhambra.

Everett Cogan reported on the activities of the association, as he did at each of the meetings he attended. First was of growth in the organization. Whereas only a few years ago its membership totaled 3,000, it now is over 10,000. This has increased the work load on the headquarters and the small staff of eight is valiantly endeavoring to keep up with it.

He described the change in format and increased scope of the *News-Bulletin* and the addition of B. A. McDonald, a retired New York inspector, to the editorial staff. He explained that McDonald's opinions may not coincide with those of all inspectors but they are thought provoking and are considered a feature of the bulletin.

The membership directory has become so costly to produce, he said, that it has been decided to issue it only on an every-other-year basis. Those whose dues are not paid by April 30 were left out of the previous directory and he urged prompt payment in order to be included in the next. In answer to the criticism that insufficient time had been given to organize the meetings, Cogan explained the difficulty of getting accord among the almost 100 chapters of the association in the country so that the field staff could schedule a consistent trip to cover as many meetings as possible. He asked for cooperation in this regard.

The fire reports, which can be of

IAEI President Morr and Everett Cogan

infinite value in determining the causes of electrical fires and of discounting many claims that fires are of electrical origin, have been very slow in coming to the main office. Cogan said he had sent out more than 2,000 fire report requests and had received only 50 in return. He likewise asked for a list of the key inspectors in all of the major cities and that these inspectors endeavor to report on fires of electrical origin.

Southwestern Section President Frank Jones described the plans for the annual meeting of the section in Phoenix Nov. 4-6. The workshop idea tried at Berkeley annual meeting last year, having proved so successful, will again be used in the Phoenix annual conference.

Discussion centered about the high ampere interrupting capacity service switch or breaker situation since UL does not list switches that disconnect over 1,000 amp or 800 amp for breakers, nor does it list the fuses of the high ampere interrupting capacity type.

The afternoon session was devoted to a visit to the Underwriters' Laboratories and to witness testing procedures there as guests of J. A. McNabb, senior engineer, and his staff.

### Oregon Chapter

The Oregon Chapter was unable to arrange a meeting of its entire membership for Cogan's visit but a smaller meeting with the officers was held in Portland April 1. There is no report available concerning this meeting or of the Puget Sound Chapter, scheduled for April 3, on Cogan's calendar.

The Oregon Chapter, however, held an important meeting in Salem March 8 with Chapter President Chris Klawa of the Oregon State inspection department in charge. William Gaffney, Northwest Section secretary-treasurer, was present for this meeting, as well as Norman Nilson, commissioner of labor for Oregon. At that time the next meeting was arranged for June 8 at Klamath Falls, over which C. C. Collins is in charge.

C. W. Brissenden, general sales manager of Portland General Electric Co., addressed the meeting, reviewing the tremendous growth of the electrical industry in the area in the decade from 1946 to 1956 and what this has meant to customer usage in the homes, particularly the older homes in the area. Future growth, likewise, promised to be as phenomenal, he pointed out, and he asked the inspectors' help in overcoming the present weakness of the industry. "What is the weakness?" he said. "Simply stated, it is that the rank and file of electrical contractors are not prepared to give the homeowner what he needs and really wants in terms of full Housepower. Even though the purchaser is ready to buy the medium-priced job with automatic transmission and most of the extras he is being sold the stripped-down model anyway." He then described the Housepower Forum which was being started in cooperation with the NECA and the independent electrical contractors. He urged much closer cooperation between the various branches of the industry to see that the public receives more Housepower.

R. H. Kuedell, distribution engineer of the same company, Salem office, also deplored shortchanging the customer by shortcutting the code in residential wiring and told of the company's recognition of the growing use of power by substituting a new constant of 450 for the old one of 300, in basing its transformer sizes.

Brissenden suggested that changes in the national code be made so that FHA proposals relative to diversity and demand more closely coincide with each other. As always, the Oregon Chapter ended with a very lively code discussion and question-and-answer session.

### Eastern Washington

An evening meeting in Spokane was held April 5 by the Eastern Washington Chapter at which 30 members and 17 visitors attended. Roxie Countryman presided as chairman.

H. S. Morr, president both of IAEI and the Northwest Section, discussed the problem that growth had brought to the IAEI head office. Cogan gave the address which he gave to the other meetings regarding IAEI activities. William Gaffney, Northwest Section secretary-treasurer, announced the Northwest Section annual meeting in Spokane Sept. 9-11.

A code discussion committee, consisting of Gaffney, Cogan, Morr, Paxton and Countryman, then heard questions from the floor and gave answers to these questions. These were in respect to flush fixtures and fixture wire, large-size service entrance cables not UL listed, whether hollow spaces in masonry walls are excluded from hazardous areas, and the old question of tie-handles on circuit breaker panels.

### Idaho Chapter

Bill Hopper, late electrical contractor who had been so active in support of inspector and contractor groups in Idaho, was memorialized as a measure of appreciation during the Idaho Chapter meeting in Boise April 8, over which A. H. Gates, chapter chairman, presided. Henry Falkner made an address in Hopper's honor.

After welcoming by the mayor and other business, Don Baird, municipal inspector of Caldwell, discussed the problems of municipal inspectors having various responsibilities in addition to electrical inspection. He called his talk "Several Hats." Earle E. Koehler, commissioner of law enforcement for the State of Idaho, talked of the department's policies and of electrical inspection by the state. C. J. Bradford, secretary-manager of the Snake River Valley Electrical Assn., told of the relation of that association to the electrical inspector.

"Standardization of Electrical Inspection" was discussed by J. Carl Baldridge, state electrical inspector, who urged that, for greater service to the public as well as to the industry, the more standardization the better. Everett Cogan discussed the IAEI as previously reported.

"The Hells Canyon Program" of Idaho Power Co. was then described by John Kimball, executive vice-president and general manager.

The afternoon session was prefaced by the memorial to Bill Hopper. This was followed by a code panel of which Cogan was moderator; P. H. Forte, Les Johnson, Clyde Hicks and Mark H. Lundy were panel members. A question was directed to be sent to Henry Watson, chairman of code panel No. 2, for clarification. It asked whether nursing homes should be considered as residential occupancies with respect to the number of receptacle outlets; likewise for

Las Vegas meeting of Nevada Chapter gave opportunity for meeting of Frank Jones, Southwest Section president, IAEI President Morr and SW Section secretary LaFehr

New Nevada officers — seated, John Smales, secretary, P. Gibson, president, Charles LeClare and (standing) Prof. I. J. Sandorf and Mel Lundberg, executive committeemen

clarification of interpretation of a combination living and dining room, where only an imaginary line separates the two. A motion was likewise passed that the chapter favor a change in the code requiring the entire wiring to be in metal raceway or mineral-insulated cable if installed in a place of public assembly seating more than 100 persons.

In the election of officers, J. Carl Baldridge, state electrical inspector, was named chairman; Floyd Warner was named vice-chairman of the first district; R. E. Gudeman of the second district; Ralph Foley, third district; and Hy Hansen, fourth district. Mark H. Lundy was reappointed secretary-treasurer and A. H. Gates, past chairman, Charles W. Davis and Clyde Hicks were named to the executive committee. Joe I. Wright, Afton-Lemp Electric Co., was chairman of the evening banquet.

**Utah Chapter**

Utah's amended contractors' licensing law, just passed, proved to be not only the center of interest but also of disappointment to those who attended the Utah Chapter's annual meeting at Hotel Newhouse April 15 in Salt Lake City. Many members of the group had worked hard for the passage of a state electrical inspection bill, which failed to come from the sifting committee in time for floor action before the legislature adjourned. The contractors' bill, however, had passed and there was curiosity as to what it would do for the electrical industry.

The conference was presided over by A. H. Bywater, chairman of the chapter, Utah Fire Rating Bureau. Both Bywater and Loren Christensen, secretary-treasurer and Salt Lake City chief inspector, deplored the loss of the inspection bill. The latter suggested more interchange of membership with other organizations, such as the union and the manufacturers association in the furthering of a state code.

The new state contractors' licensing law was discussed by B. L. Bettilyou, chairman of the Utah State Licensing Committee. He pointed out the differences between the old law and the new, which sets up a complete new department with full-time administration empowered to issue licenses under the Public Service Commission. The bill provides for inspection of buildings up to a reasonable standard but not to interfere with local inspection that exists. The new law will require examination to determine fitness of contractors to practice, a higher annual license and fee, but it exempts work under $1,000 from where the inspectors felt most of the trouble comes. Electrical contractors would come under a third classification for specialty contractors. Agriculture is exempt and individuals may do their own work on their own property for their own use. Bonding was originally requested but was stricken out. In the considerable discussion of details that followed, dissatisfaction with the bill and some difficulties because of peculiar last-minute changes were anticipated.

Both Everett Cogan and Harold Morr discussed the IAEI along lines previously reported. An afternoon session began with discussion of FHA electrical requirements and policy by Henry P. Kipp, director of FHA for the area, and Homer Wade, supervision construction examiner. Differences between the MPR and the NECode brought forth many questions.

L. B. Johnson, General Electric Co., conducted the code discussion in which the major question centered about temporary service poles and the making of a neutral connection after the switch rather than before it since the metal system makes disconnection of the neutral impossible. During the discussion, Christensen, Salt Lake City inspector, declared that the city was considering eliminating water systems for grounding because of the more extensive use of fiber or plastic pipe for the water system and in making water connections.

In the election of officers, W. T. Haws of Provo was elected chairman to succeed A. H. Bywater of Utah Fire Rating Bureau, who in turn became secretary-treasurer. Norman C. Hall, Salt Lake City inspector, was named first vice-chairman and William Whetton of Ogden second vice-chairman. A resolution was passed urging the state to reconsider and pass an electrical inspection law.

At the evening banquet, Christensen was the principal speaker with an inspirational talk entitled "The Light in Your Life." C. T. Brooke of Underwriters' Laboratories, Santa Clara, performed feats of magic.

With humbleness and sincerity the new chairman, William Haws, accepted the post and urged an educational program to the public through all the media possible.

L. B. Johnson was chairman of the annual meeting committee, A. V. Bronson and Christensen of finance, J. Hyde Stayner and J. J. Nielsen of program, A. E. Fleming of banquet, W. C. Huckins and J. E. Smith, publicity, R. K. Williams and A. A. Ross, hotel and registration, and D. O. Harvey, the friendship hour.

**Nevada Chapter**

Although a small chapter, covering the great open spaces of Nevada, something of a convention was made of the April 27 meeting of the Nevada Chapter in Las Vegas at the

Utah officers—standing, Norman Hall, vice-president; A. H. Bywater, secretary; seated, President W. T. Naws and William Whetton, Ogden, second vice-pres.

Fremont Hotel. It began early in the morning with a code breakfast, opened by J. Peters of Carlon and over which J. Hyde Stayner, Utah Power & Light Co., presided. Discussion centered around supporting of periscope service heads.

The morning session started under the chairmanship of A. P. Gibson, Southern Nevada Power Co., and then was conducted by Prof. I. J. Sandorf of the University of Nevada, Reno. In the absence of Francis Wells, Irving Werner, Las Vegas, acted as secretary.

President Morr substituted for Everett Cogan in reporting on the activities of IAEI. The executive council of IAEI, he said, will meet at the time of the NFPA meeting in Los Angeles late in May and will discuss the entire program. He urged chapters not to depend for all direction from headquarters but to develop strong leadership among themselves at the grass roots and coordinate with the international office.

Frank Jones, president of the Southwest Section, described the workshop method for the annual meeting in Phoenix Nov. 4-6. Lou LaFehr, secretary-treasurer of the Southwest Section, gave a message from Herb Ufer and spoke relative to payment of dues and the membership directory.

Legislation proposed at the last legislature had failed to pass and Harry Adams, IBEW business manager, Reno, discussed the need of the industry working together to get state inspection. Electricians and contractors, he advocated, should work hand in hand selling more electrification to industry and the home. Safety inspection under the Nevada industrial commission, he felt, was not adequate and that state inspection of all electrical work was a necessity.

A contractor, H. B. Hillis of Shock Electric Co., Las Vegas, presided over the code panel discussions in the morning and Emmet Markel, Las Vegas electrical inspector, in the afternoon.

Problems pertaining to electric heating are serious in the Las Vegas area. Gibson asked how it was best proposed to handle heat pumps and refrigeration when these come in quantity. It has a different type of demand from resistance demand and with it industrial-size motors will be used in residential occupancies. A 480-v secondary service is being contemplated for residential tracts in Las Vegas in anticipation of this type of demand, he told the group.

H. E. deVilliers, manager, Nevada Chapter NECA, Las Vegas, and a member of the state examining board, told of ordinances recently passed in Henderson and in North Las Vegas and the requirement in Clark County for examinations, effective May 6. He discussed state licensing of contractors and advocated it as well as state inspection.

In the election of officers A. P. Gibson of Southern Nevada Power Co. was persuaded to accept the chairmanship, Lynn Steiner, superintendent, Ely Power & Light Co., vice-chairman and John F. Smales, city inspector in Elko, the secretaryship. Executive committeemen include W. W. Kline, Clark County inspector, Charles LeClare, Reno city inspector, Prof. I. J. Sandorf, University of Nevada, Howard Lindsey, Cal-Pacific Utilities Co., Winnemucca, John Kitchen, distributor, Reno, R. E. Osborne, distributor, Las Vegas, Francis Wells, Osborne & Dermody, Reno, and M. E. Lundberg, Elko-Lamoille Power Co., Elko.

"Engineering Education" was the subject of Dwight Hoopes, chief engineer, Southern Nevada Power Co., at the evening banquet, presided over by Mel Lundberg. Citing the tremendous growth in technology in the industry, he advocated that inspectors continue to study. Electronics, he said, is the key to the future and he showed how important it is to keep abreast of this fast-moving phase of the industry. Automation is hand in hand with electronics and mechanization has taken over a great deal of industry. The people of the future will find a crying need for engineers, yet engineering training, unfortunately, has decreased while in Russia it has been increasing. Survival of the nation depends upon its science and engineering progress.

**Montana Chapter**

Unable to make meeting arrangements to fit with Cogan's April schedule the Montana Chapter held its meeting May 3-4 at Hotel Rainbow, Great Falls, with Otis Pyatt, Great Falls electrical inspector, as chairman. C. W. Brown, Glacier State Electric Supply Co., talked on "Touch Plate Wiring." L. B. Johnson, General Electric Co., Salt Lake City, described new wiring materials on the market. "Existing Wiring Problems" were brought in by Charles Carrico, fire chief.

After luncheon Clarence Kommers, Montana Power Co., Butte, discussed the Housepower campaign and its effect on the industry. Code discussion followed in the afternoon under a panel consisting of Carl Palmquist, contractor, Kommers, Pyatt, Alfred Rowe, contractor, and Al Hull, REA, Lewistown area. A visit to the Anaconda Copper Co. wire mill was made in the afternoon, before the banquet at which William Haney was toastmaster.

The Saturday session discussed "Farm Wiring Needs" under Harold Ebaugh, manager, Hill County Electrical Co-op. An explanation was then gone into of the new state electrical inspection law. This was done by Harvey Stone, electrical inspector of Helena, and Eldon Shirley, electrical inspector, Billings. Homer Morton, electrical engineer, Malmstrom Air Force Base, then gave a talk on the need for a uniform electrical code for the State of Montana.

**Other Chapters**

Scheduled for May 3 also was the annual meeting of Rocky Mountain Chapter, IAEI, at Auditorium Hotel, Denver. To this, Everett Cogan was scheduled to appear to give his report on the IAEI. The meeting was to be a luncheon meeting only.

New Mexico Chapter likewise had a meeting scheduled with Cogan on May 6 in Albuquerque but report of it has not been received.

Arizona Chapter had a special meeting May 8, in Phoenix for Cogan to give his IAEI message to Arizona members, some 19 of whom were able to attend. The regularly scheduled chapter annual meeting was scheduled to be held in Nogales, May 11.

# GROWTH

**GROWTH** . . . the great fact of Western life for our day. Growth in population, in business, in industry . . . and most of all growth in the demand for electric power and the many services of electrical living.

**CHALLENGES OF GROWTH** . . . nowhere more critical than in the well-integrated electrical industry, where utilities and manufacturers, contractors and wholesalers count on each member of the electrical team to pull together so that the West's development will not fall short for want of kilowatthours and the goods which generate, transport and consume them.

**OPPORTUNITIES IN GROWTH** . . . with the electrical industry the key to efficient expansion there are opportunities equal to the challenges and responsibilities . . . larger and more profitable loads for utilities . . . bigger markets for manufacturers . . . more jobs for contractors . . . more customers for wholesalers.

**A NEED TO WORK TOGETHER** . . . to understand the common problems and to share the common opportunities the electrical industry in the West more than ever before needs to "work with itself" in its own committee meetings and forums.

**THE PCEA IS A WORKING ORGANIZATION** . . . its members are hammering out practical answers to the problems of growth in dozens of meetings throughout the year . . . PCEA strength is in the enthusiasm and energy of its individual members . . . thanks to them and their day-to-day efforts, this Association "gets things done that many people think just happen".

PCEA **PACIFIC COAST ELECTRICAL ASSOCIATION**

530 W. Sixth Street
Los Angeles 14

681 Market Street
San Francisco 5

NEWEST REASON WHY ALL TRANSFORMERS ARE NOT ALIKE

# Molded Covers: now on trial

**Unique development represents General Electric's first step toward a molded distribution transformer cover with molded-in bushings to reduce costly service trips.**

The improved molding material for General Electric's experimental distribution-transformer covers and bushings is designed to prevent creep tracking—a common occurrence when conventional organic insulating materials are used in contaminated atmospheres. In the photo above Distribution Transformer Department's M. Broverman, Mgr. Design Engineering (left), and W. A. McMorris, Mgr. Advanced Product Engineering, study a completed assembly. The molded parts will be given extensive tests on utility systems this year.

The new molding material is an outgrowth of General Electric's development of molding materials resistant to arc tracking, first introduced by G.E. in the late nineteen-forties for molded instrument transformers.

### Present design is only first step

The new molded bushings and covers, representing the first step in this development, utilize newly developed materials to replace steel covers and porcelain bushings. Plans for more advanced molded covers and bushings, however, are already on the drawing board and models are already in Pittsfield testing laboratories.

### Next: one-piece designs

Present plans call for eventually molding the high-voltage bushing and the cover in one operation to give one-piece construction. This will reduce the number of openings into the tank.

### Cost a major factor

Wide manufacture of General Electric's new molded covers and bushings must wait a few years until resin prices—now on the downswing—reach competitive levels. Then utilities can expect several benefits from G.E.'s new development.

### Utilities will benefit

Units with molded covers will need fewer repaintings, since the cover, now the part most subject to weathering, will remain factory fresh. Bushings will last longer—molded materials resist damage better than porcelain. Finally, squirrels and birds will not short out units because the cover itself is an insulator.

### All Transformers Are Not Alike

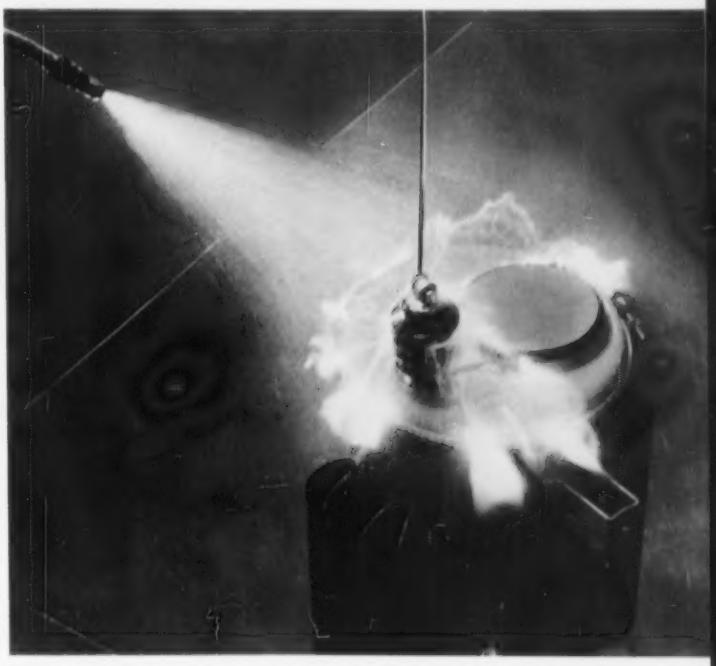
Continuous engineering development is only one advantage of General Electric distribution transformers. Others include *engineered packaging*, coast-to-coast *warehouse facilities* for fast delivery, *Formex** wire for reductions in tank size, self-protected transformers with new, improved *circuit breakers*, and many others—evidence that all transformers are *not* aljke.

LIVE BETTER ELECTRICALLY

For complete information, contact your nearest G-E Apparatus Sales Office or G-E Agent—or write to Section 431-53 General Electric Company, Schenectady 5, New York.

*Reg. Trademark of General Electric Co.

**NO MORE TROUBLE WITH SQUIRRELS.** New cover is made of non-tracking high-resistance compounds to prevent squirrels and birds from causing line outages, thereby reducing costly service trips.



**DIELECTRIC TEST.** Simulating an electrical discharge during a heavy rainstorm, test subjects molded bushing and cover to wet flashovers of 50,000 volts at 60 cycles. Despite repeated flashovers, there is no tracking and no damage to the molded materials.

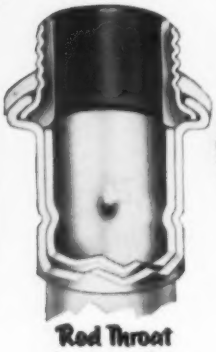
*Progress Is Our Most Important Product*

GENERAL ELECTRIC

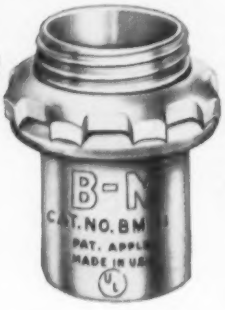
# B-M

*the original concrete-tight* **INDENTER FITTINGS** *for E.M.T.*

**Red Throat** Insulated Connector



**Red Throat** Cross section



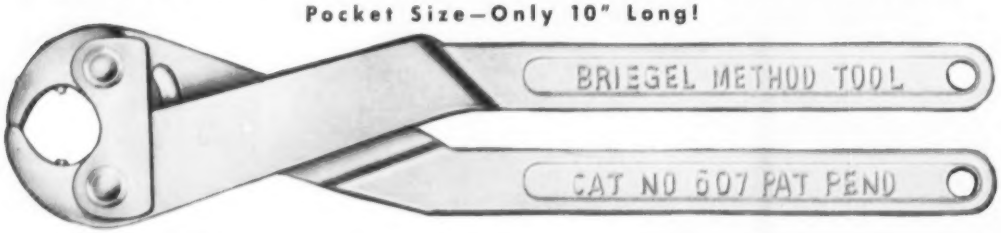
**"BM" #100**
Cutter for ½, ¾ and 1" E.M.T.

**"BM" #1000**
Holder for ½, ¾ and 1" E.M.T.

**"BM" #600**
Changeable Jaw Indenter

## THE NEW BM607 INDENTER FOR ½" FITTINGS

**Pocket Size—Only 10" Long!**

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Robert Salter leads a land and right-of-way discussion session against the pleasing setting of Carmel's La Playa Hotel pool

**PCEA-PCGA Joint Conference Concludes . . .**

# Management Makes the Difference

OF the many subjects being tossed around at the La Playa Hotel in Carmel April 24-25, one of the most interesting was Donald E. Shively's "The $64,000,000 Challenge in Customer Relations." Along this same line was ample evidence, in discussion periods and in talks, that the utility customer service departments are rapidly becoming the centers of working public relations. As one customer service man said:

"Call it public relations or customer relations or customer service —or anything you want to. The fact is, we are the ones in direct contact with individual customers. We make friends for the company only one at a time—but we make friends for the company."

The occasion at Carmel was the joint spring conference of the PCEA Administrative Services Section and the PCGA Accounting Section. About 100 persons attended the two-day meeting, which was comprised of discussion sections on customer relations, internal auditing, management of cash and right-of-way and land.

## Customer Relations

*Harry E. Welsh, Sponsor*

Donald E. Shively, Southern Counties Gas Co., drew an interesting parallel in his "$64,000,000" talk. He compared utility-customer relationships with the big television give-away contests.

"In our case the public, our customers, as the sponsor, develops the questions and judges the accuracy and adequacy of the answers we give. We, as the contestants, must demonstrate in the development of our policies and procedures, and in the training of our personnel, that we have a thorough knowledge of our subject, that of providing the best possible utility service to our customers."

The challenges, following Shively's simile, come from certain political and economic "thinkers" whose ideals and principles are contrary ". . . to those principles and concepts . . . all of us hold to be . . . responsible for the economic and political strength of this country today."

Shively presented good customer relations as being the way to win the "$64,000,000" question. He presented a "formula" that could be applied to help achieve this goal. A plus B plus C equals good customer relations. "A" is the administrative policy of the company; "B" is the deed or action by an employee; and "C" is the interpretation of both the policy and the deed by the customer.

"Measuring Public Attitudes" was the title of a discussion led by Mervin Field, president of his own Field Research Co. in San Francisco.

Field described methods of measuring public thinking about such things as utility company operation, ownership—or detecting the absence of public opinion, in some cases.

George S. Coates Cullen W. Coates R. D. Scott

Here, again, the importance of constructive contact with individual customers was brought out. Field emphasized the need for well-trained customer service employees who will recognize and properly utilize opportunities to personalize the utility to its customers. His discussion was followed by "Customer Relations Training," led by J. F. Brennan of Pacific Telephone & Telegraph Co. who presented the details of training employees who contact the customer in person.

### The Business Climate

In the final session of the customer relations section, Robert W. Jackson, Western regional public relations manager for General Electric Co., talked on "Your Stake in a Better Business Climate."

Summarizing his talk, Jackson said:

"All businessmen have a common goal—to make sure that they deserve, and then get, the full understanding, warm approval and stout support of those who, at the market place and voting booth, affect business' ability to live up to its full usefulness to all concerned."

In a sense, Jackson echoed remarks of other discussion leaders when he said:

"... even though business is progressive and contributes immeasurable good to the welfare of the country, businessmen have forgotten to get credit for it."

He said it is the responsibility of the modern, professional manager to make his opinions heard, understood and believed in the area of public opinion.

## Management of Cash

*A. R. Cox, Sponsor*

The recent tightening of money supply and the sharp increases in the costs of financing have added an even greater significance to what has always been an important part of business operations, namely, the efficient management of working cash. This is the thought that led off "Keeping Your Money at Work" by William J. Karnes of San Diego Gas & Electric Co.

Karnes said utilities, to keep the need for "new money" at a minimum, should examine carefully their present working cash position. Methods are available in business to: (1) conserve that working cash; (2) speed up cash collections; and (3) guard against having idle funds on hand. These methods can be found by investigating such areas as purchasing policies, inventory balances, accounts receivable, income tax accruals and bank balances.

If the results produce more efficiency in spending, collecting and reporting cash, the company will reap the benefits through reductions in "new money" costs, possible savings in taxes, more adequate working capital and a more well-informed management.

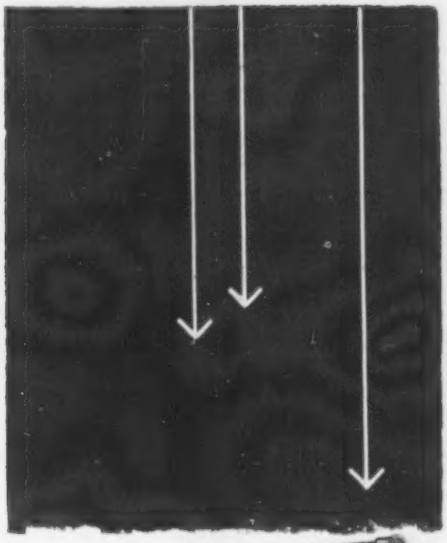
The "Management of Cash" group explored all phases of efficient handling of cash under three other discussion titles. They were "Bank Balances—How Much Is Enough?" led by A. E. Mason of Southern California Gas Co.; "Centralizing Your Cash Register," a report by C. D. Lester, Southern California Edison Co., and "Cash Forecasting," led jointly by S. M. Gilliland, Southern Counties Gas Co. and W. D. Morningstar, Pacafic Lighting Gas Supply Co.

Summarizing the various facets covered in discussion leads to considering the sources of utility cash which are: investors, banks, customers and, through selling on credit, the suppliers of goods and services needed by the utility. With these sources in mind, the group considered the finer points of when to sell stock, when to borrow (and how much), most effective methods of controlling accounts receivable and the timing of collections with payments for goods and services. All these factors were explored with the general agreement in mind that idle money is costly, especially during a tight money period.

Two fields that require constant examination for efficiency are the sales and collections practices in effect. It is an area where duplication of work, unnecessary delays and other deterrents can lie hidden and block or hinder the flow of cash. One recommendation was that outside consultants, with special training in procedures analysis, are often found to be profitable when used to examine this cash source.

Karnes capsulized the general tone of the discussions when he told the group:

"No business can afford to sit back, so to speak, and feel satisfied that its present methods of spending, collecting or reporting cash are the best possible. The interchange of methods and ideas in conferences, such as this present one, can be of great benefit to each of us



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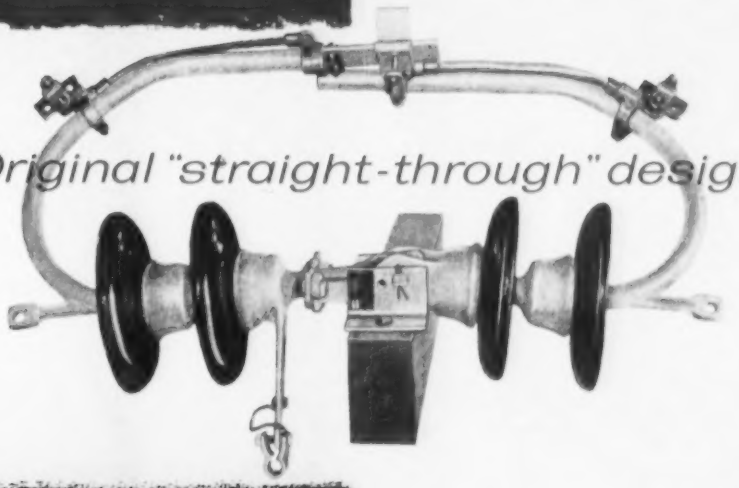

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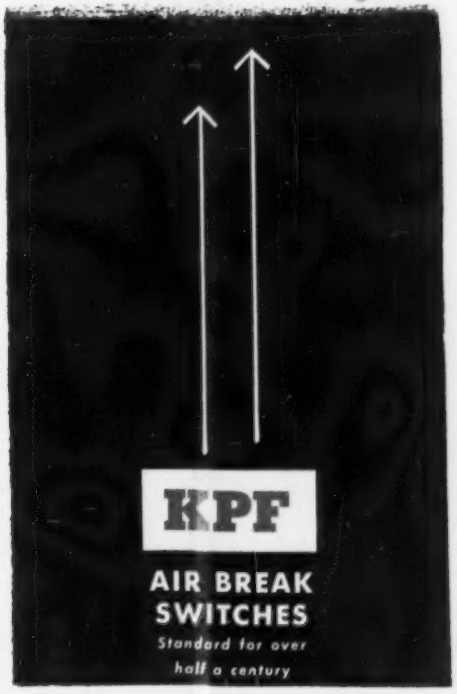


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by stimulating and channeling our efforts to apply such methods or ideas to the particular conditions present in our own companies.

## Right-Of-Way and Land

*Cullen W. Coates, Sponsor*

With land and land rights being one of the first requirements in connection with utility growth, the future for land department organizations is one of increasing activity, according to Stanley B. Barton of Pacific Gas and Electric Co.

To meet this activity will require more manpower, with the best training available, and an efficiently organized procedure. Land acquisition procedures have not changed materially over the years, but additional work load and the resulting increase in problems has affected the nature of the organization and the kind of men required to staff it.

In addition to a staff of engineers, draftsmen and land acquisition agents, administrative personnel and lawyers, or men with some legal training, are extremely essential, Barton reported. The rights to be acquired and the information and processes required, by reason of an expanding community, must be obtained if utility service is to be supplied when needed.

Lacking a source of trained manpower, it has been necessary to concentrate on advancement within the organization and to develop training courses for those classifications remaining in short supply that can not be trained effectively on the job. The general organization remains about the same as in the past, modified to meet the additional requirements.

The manpower question, or the question of training, entered in other phases of the land and right-of-way sessions. J. D. Patterson of Southern California Gas Co., in reporting on acquisition, touched some of the problems that require exceptional abilities or special training. Summarizing his presentation, he named many of these items.

The planning which precedes the negotiation phase of right-of-way acquisition for transmission lines involves the selection of a suitable route, acquisition of land title information, determination of the width of the proposed easement, valuation of land and personal inspection of the subject property.

### Fit Approach to Type

Negotiating for rights-of-way demand the skillful determination of the personality type of each property owner with whom the right-of-way agent is called upon to do business. It is his ability to fit his approach to the personality types that will result in either successful or unsuccessful negotiations.

But acquisition of land and right-of-way is only part of the functions of land departments of utility companies. The subtilities buried in acquisition problems are offset by very obvious facets in modern ownership problems—encroachment for one.

W. F. Garber of San Diego Gas & Electric Co. spoke in favor of a firm, industry-wide encroachment protection policy.

Power stations originally located in perimeter areas are now surrounded completely by subdivision and industrial developments. Corridors supplying the stations are becoming more and more difficult to maintain, and Garber proposed the uses of the rights-of-way should be held to an absolute minimum. His stand was taken on the basis that a utility company is charged with the responsibility of delivering what has become a necessity in modern living. He pointed out the very frustrating fact that necessary protection of the delivery channel, the right-of-way, is from the very individuals who receive the services of the utility. The customers are the ones who put constant pressure on the utility to allow more uses of right-of-way and more relaxed restrictions on it.

Other contributors to the various functions and problems of land departments were: Robert Salter, Southern California Gas Co.; Charles T. VanDeusen, Pacific Gas and Electric Co.; R. W. Long, PG and E; Alonzo C. Hammon, Hammon, Jensen & Wallen, Mapping & Forestry Services; and Austin C. Smith Jr., Southern California Edison Co.

## Internal Auditing

*C. S. Stebbins, Sponsor*

Though much of the program of this section was devoted to the operational methods of internal auditing departments, a thread of one general subject was woven through the discussions. The subject was "What Management Wants from Internal Auditing," with the original discussion under the direction of Granger

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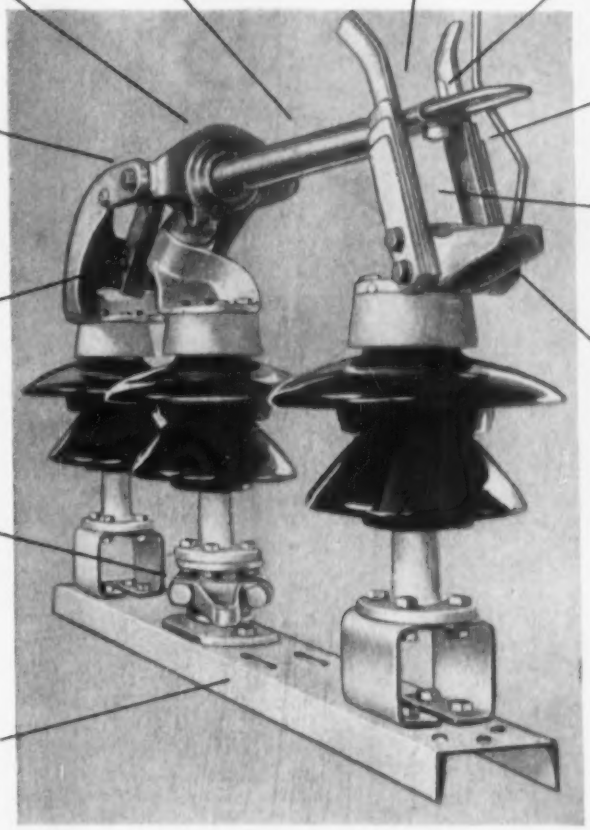

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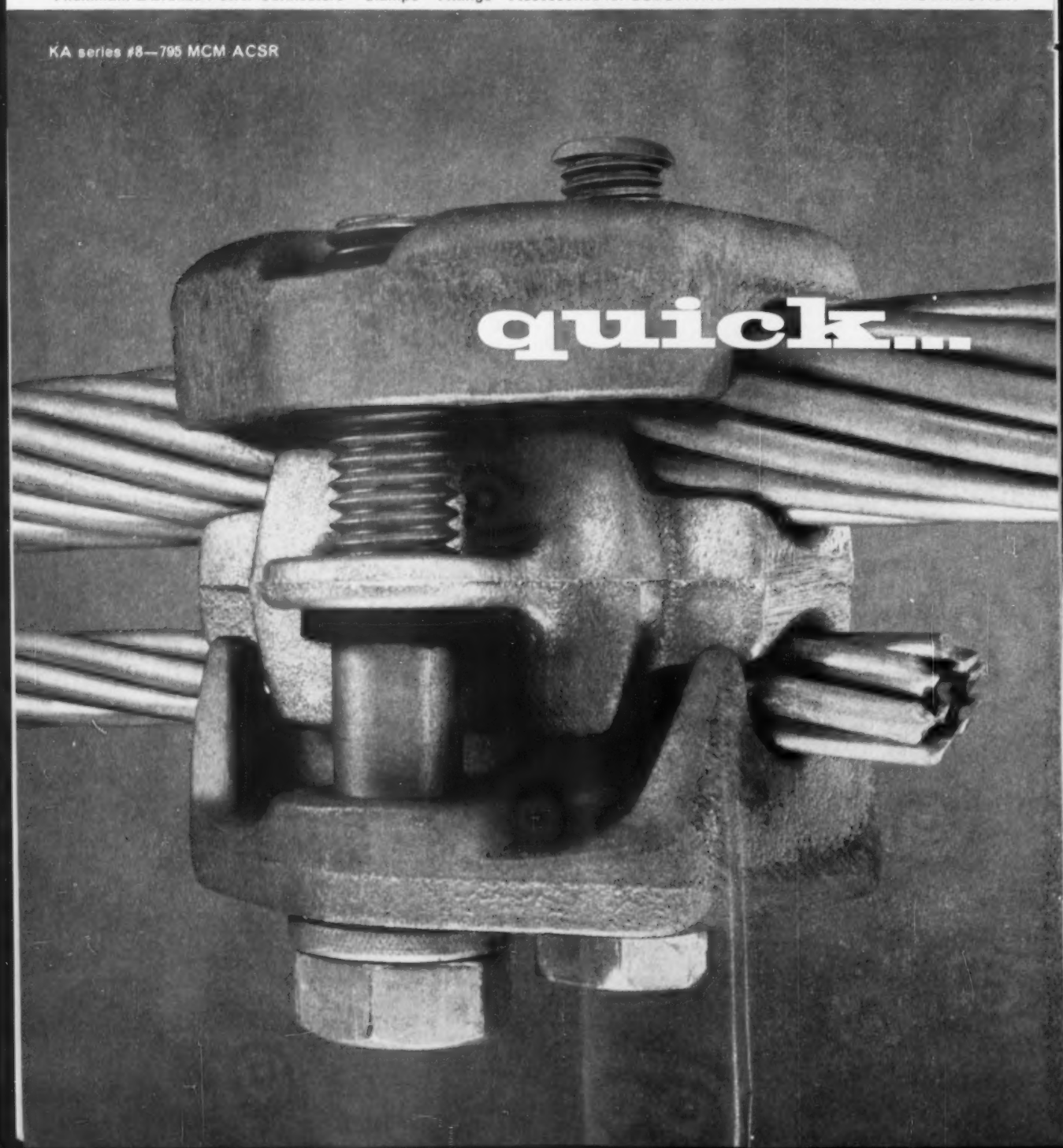

Welsh Blair

Maytham Ward

F. Hill of PG and E. Jack Graham of San Diego G&E and James P. Dingwall of British Columbia Electric Co.

Jack Graham expressed the "new look" of internal auditors as the functions of the departments broaden with changing times. From a policeman-type individual, the internal auditor has evolved to a man "who tells you where to go in such a nice way that you are looking forward to the trip." An important reason for the transition is due to the need of management for information which can be supplied by properly trained auditors, who in the normal workaday performance of their duties reach virtually every phase of utility operation.

A sequel to the changing demands on auditing personnel, still in the "hopeful" stage in many cases, is that internal auditing of the modern version is sound background and training for top management positions of the future.

On the functional side of internal auditing, W. E. Littler of Southern Nevada Power Co. led a discussion on "Protection Against Defalcation." In brief, he pointed out that the opportunity for embezzlement does exist, and that internal control, high employment standards and fidelity insurance are the three most important protective devices.

Edward G. Huot, Edison Co., and George Butler, Southern Counties Gas, contributed discussions on, respectively, "Control Over Internal Audit Activities," and "Accounts Receivable Verification Letters." Both dealt with the practical functions of internal auditing, which are not sacrificed or impaired as the broader, relatively new demands on auditors increase.

The two-day meeting was ably organized and conducted by Co-Chairmen John A. Talley and George S. Coates and Vice-Chairman W. N. Fairlee.

Luncheon speakers were Walter C. Prill of Southern Counties Gas Co.; Harry Blair, regional manager of public relations for General Motors Corp., and Walter Maytham, vice-president of Westinghouse Electric Corp. and president of PCEA.

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# THIS MONTH'S NEWS

## Aandahl Gives Details On Glen Canyon Contract

Award of contract to the Merritt-Chapman & Scott Corp. of New York for the construction of Glen Canyon Dam on the Colorado River in Arizona, has been authorized on a bid of $107,955,522, Assistant Secretary of the Interior Fred G. Aandahl has announced.

Commissioner of Reclamation W. A. Dexheimer said the contract, which is the largest single contract of record for construction of a dam, permits approximately seven years for construction. Actual award of contract for the structure will be made by Assistant Commissioner and Chief Engineer L. N. McClellan at the Reclamation engineering center at Denver.

Simultaneously, Secretary Aandahl advised agencies from the Lower Colorado River Basin states of Arizona, California and Nevada that gates will be installed in the left diversion tunnel which will be able to pass annually the entire flow of the river even in a high runoff year. The agencies had expressed concern that the closure plan as outlined in the specifications might be detrimental to downstream interests.

## Three Contractors Start Kerr Dam-Missoula Tie

Three Montana firms have begun preliminary work on a second 161,000-v electric transmission line the Montana Power Co. is building from Kerr Dam, in Lake County, to Missoula.

J. E. Corette, president and general manager of the utility, said the three firms that have teamed up to construct the 57-mile line are Lewis Construction Co. of Great Falls and Swain & Morris Construction Co. and Line Builders Inc., both of Billings. The utility plans to extend the line to Anaconda in 1958.

The new line will supplement the existing 161 kv Kerr-Anaconda line.

Forty carloads of material, much of which already has been delivered, will be used. The new line will be of the wooden H-structure, X-braced variety. Cedar poles will be used. Steel-reinforced aluminum conductor, from the Great Falls wire mill of Anaconda Co. will be used.

A fifth electric cable was recently laid across San Diego Bay from San Diego to Coronado. Major navy installations at Coronado, plus extensive residential expansion, created the need for the additional San Diego Gas & Electric Co. service. Okonite Co. manufactured the 12,000-v, three-conductor, 500,000-cm cable

## Big Expansion Started By Utah Power & Light

Purchase of land for a potential power plant site and a backbone electric power transmission corridor in Salt Lake Valley has been announced by Utah Power & Light Co.

The $500,000 transaction, announced by UP&L President E. M. Naughton, involved:

(1) A one-hundred acre plot in southwest Salt Lake City near the Industrial Center; (2) two hundred acres running in a corridor of 110 to 200 ft wide between the 100-acre plot southward to suburban Midvale where the utility is currently constructing a $1,000,000 substation.

Naughton said the 100-acre plot west of the Industrial Center was purchased as a long-range potential site for a steam electric plant.

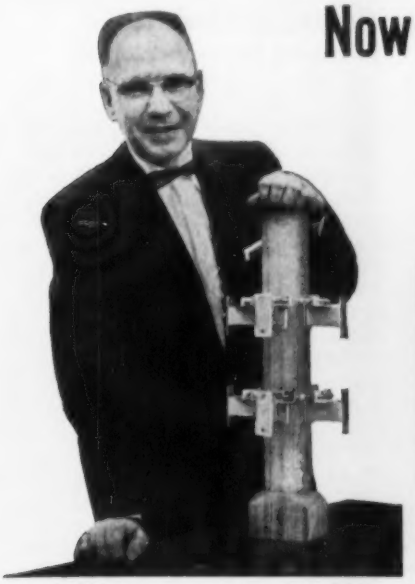
The land corridor running from the plant site to the substation west of Midvale will ultimately carry as many as three power lines of various voltages to serve as a transmission grid in Salt Lake Valley.

In addition to the large substation southwest of Midvale, another substation will be constructed in the corridor at 30th South to step down high voltages for commercial and residential distribution.

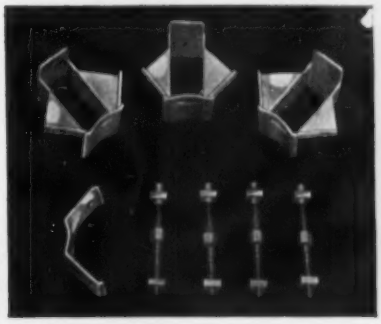
Naughton said the construction of the Midvale substation will be

# Now one transformer mount fits all poles 6½ to 16 inches in diameter!

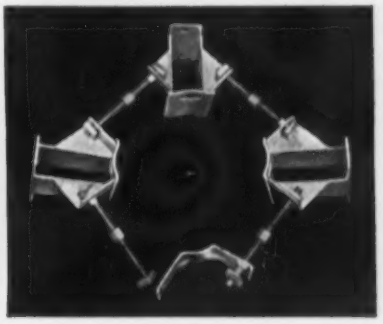
## New Hub-Mount* takes all EEI-NEMA Transformers 3 kva to 167 kva in one, two, three combinations



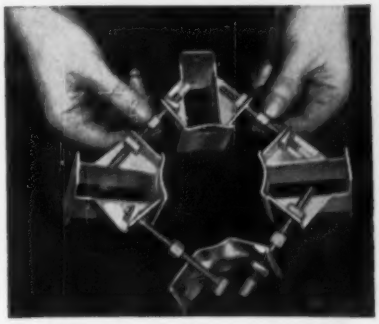
## Working scale model demonstrates ease of assembly!



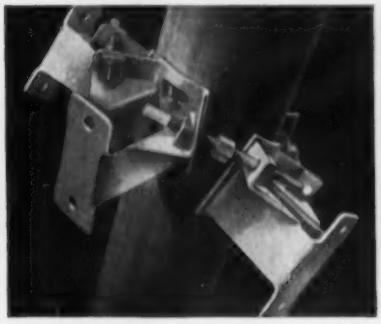
**1. HUB-MOUNT** assembly is made up of 1, 2 or 3 mounting boxes and quarter plates plus 4 turnbuckle-type bolts. Connecting bolts are fabricated from Cor-Ten steel for long service life. In tests, Hub-Mount has supported more than three times the weight of three 167 kva transformers without any visible deformation!



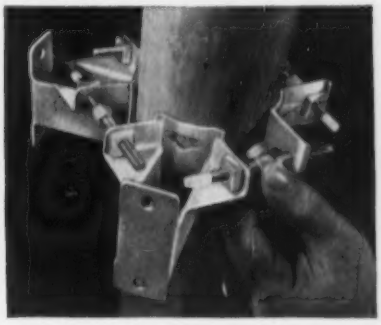
**2. GROUND ASSEMBLY.** With so few parts, assembly is simple, trouble-free. Left hand bolt threads and nuts are color-coded to speed assembly by eliminating trial and error. Hub-Mount's all steel design eliminates carpentry, periodic maintenance present in platform construction.



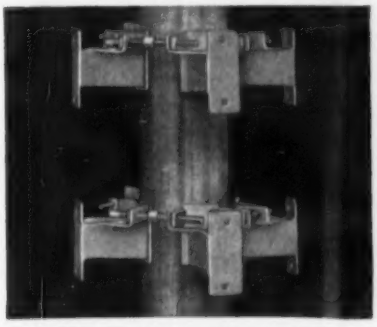
**3. GROUND ADJUSTMENT.** Turning downward on hex section of turnbuckle bolts adjusts size of Hub-Mount to pole diameter at the point of installation. Hub-Mount has only four points of adjustment. By adjusting three of them on the ground, it is only necessary for the lineman to wrench at one point on the pole.



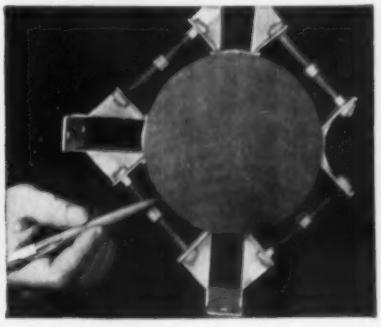
**4. MOUNTING.** Hub-Mount is lofted to the pole, hung from one lag screw driven into the pole at the desired height. This leaves the lineman entirely free to complete the installation, by connecting open turnbuckle bolt to quarter plate. Lineman makes his installation from one point on the pole!



**5. FINAL ADJUSTMENT.** Wrenching downward on the hex section completes installation. When installed, Hub-Mounts work in compression, are not loosened by pole shrinkage. The weight of the transformers causes the Hub-Mount to bind on the pole, thereby maintaining a tight grip.



**6. READY FOR TRANSFORMERS.** This simple, flexible arrangement accommodates all EEI-NEMA transformers from 3 kva to 167 kva in combinations of one, two or three. Hub-Mount's exclusive design places no reliance on welds, which work in compression, do not govern available strength.



**7. WRENCH CLEARANCE.** Note wrench clearance at maximum adjustment on 16 inch pole diameter.

*Patent Pending

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## AND COMPANY

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Plano, Texas

Slightly more than 40 years ago, L. C. Owen (center), proprietor of a general store in the community of Dennison, Wash., happily paid a $3 deposit, blew out the kerosene lamp and turned on the first electric light in town. He was a customer of Little Spokane Light & Power Co. Recently the deposit slip was taken from a forgotten file and presented to Washington Water Power Co., a successor of the original company, for redemption. WWP Treasurer A. F. Elder, right, and John Johnson, local company representative, presented Owen with a check for $3 plus 8% interest for 40 years. Owen had another deposit slip issued in 1917. The two earned $24.68

completed by mid-summer in time to receive power from the firm's 100,000-kw Carbon plant second unit now nearing completion at Castle Gate, in Utah's coal fields.

## Bureau and Edison Agree On Mammoth Pool Plan

An agreement for the hydroelectric power development planned on the San Joaquin River at Mammoth Pool by the Southern California Edison Co. has been reached between the power company and the federal Bureau of Reclamation.

C. Norman Murray, assistant regional director of the bureau's Sacramento regional office, said the agreement was worked out by the bureau, the company and local interests. The problem involved an arrangement which would not interfere with the irrigation operations of the Central Valley Project's Friant Dam.

The Mammoth Pool development will be upstream from Friant Dam. Negotiations between the bureau and Southern California Edison have been under way for five years.

Southern California Edison proposes a $44,500,000 project on the river, including a 315-ft-high dam to create a reservoir of 123,000 acre-ft capacity and a power house of 126,000 kw capacity.

## Idaho Starts Hook-up Of Boise-Brownlee Dam

Idaho Power Co. has started construction of a $4,500,000, 230-kv transmission line between Boise and its big hydroelectric development on the Snake River at Brownlee.

The 100-mile line is being built by Idaho Power mobile crews and the Morrison-Knudsen Construction Co., contractor at the dam. At the height of construction, a work force of about 220 men will be on the Brownlee - Boise transmission - line project.

Supported by 409 steel towers ranging in height from 100 to 150 ft, this will be the biggest line on the company's system. The steel towers will be capable of carrying two circuits, each built to operate at 230 kv.

Engineering for the transmission development has been virtually completed and much of the steel has already been stockpiled at suitable places on the route to be taken.

A 230-kv wood tower line is also being built between Brownlee and Baker, Ore., a distance of about 42 miles, for the exchange of electricity at this voltage with members of the Northwest Power Pool. Total cost of the transmission facility, from Boise to Brownlee and thence to Baker, is estimated at $5,816,000.

## Washington State Plans Changed on Generation

A change in administration has resulted in a new approach by Washington state officials to proposed construction of a steam generating plant.

The former Republican administration, through its state power commission, proposed that the state actually go into the power-generating business, constructing and operating a steam plant. The recent session of the legislature voted an end to the commission, however, transferring the steam plant project to the State Department of Conservation and Development.

Present thinking at the state capitol in Olympia is that the state simply should develop the steam-plant plan and turn it over to the state's public and private utilities. The Puget Sound Utilities Council, composed of four public power agencies and Puget Sound Power & Light Co., is mentioned as the type of organization that might develop the plan.

The commission had a tentative arrangement to buy federal secondary power from the Bonneville Power Administration, to be used in conjunction with steam power, but had been unable to get a firm long-term price on the coal supply the plant would require. The present administration, which allotted $275,000 to study the project, hopes to get firm commitments for secondary power from Bonneville and nonfederal power suppliers and also to work out the problem of coal supply.

Gov. Albert D. Rosellini is expected shortly to name an advisory commission, probably of five members, to steer the project.

## Seattle Advances Money For Fish Run Studies

Seattle City Light has negotiated an agreement with the Washington State Department of Fisheries under which the municipal utility will provide up to $58,000 for research and study of the effect on salmon runs if it builds a dam at the Copper Creek site on the Skagit River.

The utility is conducting foundation studies at Copper Creek, seven miles downstream from its present Gorge plant, to determine feasibility of a dam and 60,000-kw power plant.

The $58,000 includes $12,000 City Light has given the Corps of Engineers to help finance an experimental artificial spawning ground for salmon at McNary Dam. Paul J. River, City Light superintendent,

**GENERAL CABLE**

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# POWER CABLES

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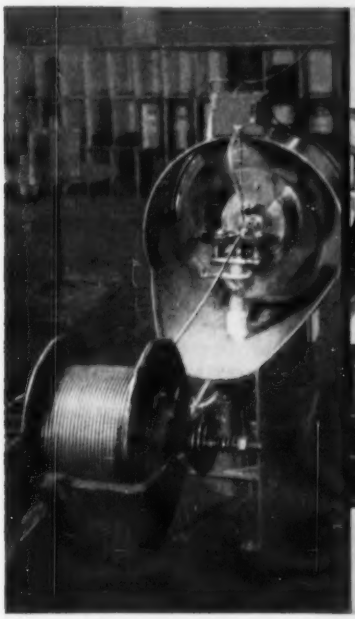
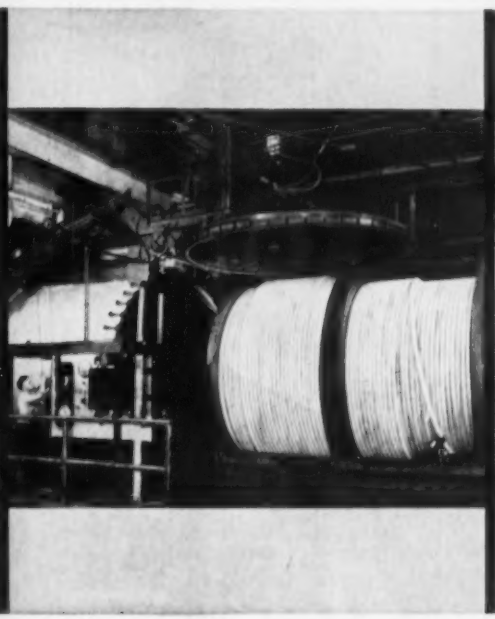


This machine forms steel strip into helical coil ducts or channels for use in gas filled or oil filled cable.



Impregnating Tank utilized in the heat-vacuum drying and oil impregnation steps in the manufacture of Paper Power Cable.

Large Cabling Machine used in cabling individually insulated conductors into multiple conductor assemblies.

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The excellent operating record over many years and the superior electrical characteristics of paper insulated cable highly recommends its use for all power applications. Paper Power Cable is a predominant type in preference and use for voltages above 5 KV.

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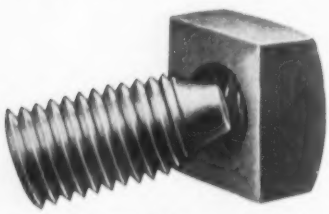

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explains: "the Department of Fisheries feels that the results of the McNary Dam experiment may give them information of value in determining what protective measures will have to be taken at Copper Creek."

The Corps of Engineers also has received funds for the McNary Dam study from other utilities.

## WWP Starts Building Big Transmission Line

Growing stockpiles of materials along seven railroad sidings stretching southward from Spokane to Lewiston marked the beginning in April of a $3,200,000 transmission line which will help bring additional energy into the power-hungry Palouse and Lewiston areas.

In building its newest and most powerful transmission line, the Washington Water Power Co. is making exclusive use of aerial surveys for the first time in its 67-year history to determine the route the line will take, according to WWP Chief Engineer Lester R. Gamble.

From 80 to 100 men will soon be at work on the project, stringing thousands of pounds of 1¼-in. aluminum conductor along the line's 107-mile path.

Construction will begin at both ends of the new line, Gamble reports, with crews to meet just east of Farmington, Wash., about the end of November this year. The most spectacular single span, 2,300 ft long, will be built across the Clearwater River at Lewiston. The long span is necessary because WWP is building a new terminal substation for the line in the Lewiston Orchards district on the south side of the Clearwater. This substation facility alone will cost an additional $878,000.

Rapid population and industrial growth in the Lewiston-Clarkston area is expected to triple the area's need for electricity in ten years, WWP engineers predict. Al Gruber, Lewiston Division manager for the company, said that a recent study of electrical load growth in the area revealed that electrical use had been increasing about 12% annually for the last four to eight years.

## Tacoma Planning Appeal To U.S. Supreme Court

The city of Tacoma has been granted authority to protect its investment in the Cowlitz Dam project while it appeals to the United States Supreme Court, a State Supreme Court order holding the project to be illegal.

Chief Justice Matthew W. Hill of the State Supreme Court has signed an order modifying an injunction blocking further expenditures on the $130,000,000 two-dam hydroelectric project.

Under provisions of the new order, which is good until Dec. 31, the city of Tacoma may expend funds to protect its $7,000,000 investment in the project. The expenditure must be confined to custodial, safety, security, maintenance and other items for the preservation and construction at Mayfield Dam.

The city also can negotiate with the state for possible acquisition or relocation of the Game Department's

Meter readers of the Los Angeles Department of Water & Power receive supplies of "lolli-pups" from Rosine Nicassio, clerk in the customer accounts department, and daughter of senior meter reader Sam Nicassio. The dog confection now is carried as standard equipment by department meterm·n as a part of their "Operation Fido"

fish hatchery at Mossyrock. The high court in February held that the hydroelectric project is illegal because Tacoma does not have authority to condemn the fish hatchery which would be inundated by the Mayfield Dam.

## Eugene Restates Intent To Build Beaver Marsh

The Eugene, Ore., Water & Electric Board has reaffirmed to the Federal Power Commission its intention to start and complete its 30,000-kw Beaver Marsh project on the upper McKenzie River.

The resolution adopted by the board was requested by the FPC. The FPC granted an 18-month license extension in January, but Congressman Charles O. Porter asked the FPC to cancel the extension on grounds the utility has indicated it no longer seeks local authorization of the project.

An $8,500,000 revenue bond issue for the project was defeated by Eugene voters March 27, 1956, after a campaign in which opponents maintained the project would ruin scenic and recreational attractions of the upper McKenzie region.

EWEB Superintendent R. B. Boals said the board will probably call another election if study shows the project economically feasible. Such an election, he said, would have to be held within a year to come within the 18-month license extension deadline.

## Big Spending Needed For Northwest Power

An estimated $3,204,000,000 will be needed for facilities to meet the power needs of the Pacific Northwest between 1958 and 1967, A. B. Martin, management coordinator for Pacific Northwest Power Co., said last week at a Spokane Chamber of Commerce meeting.

Some of these projects have been scheduled, he said, but $2.2 billion worth have not been identified with approved or licensed projects.

"It is unreasonable to expect that the federal government will supply more money for dam building in the Northwest than it has in the past," he said, noting that federal expenditures for power projects have averaged about $156,400,000 a year during the last decade.

"Means other than federal must be used to finance at least $2 billion of the 10-year capital requirement (1958-1967)," he said. "All power groups, private, municipal


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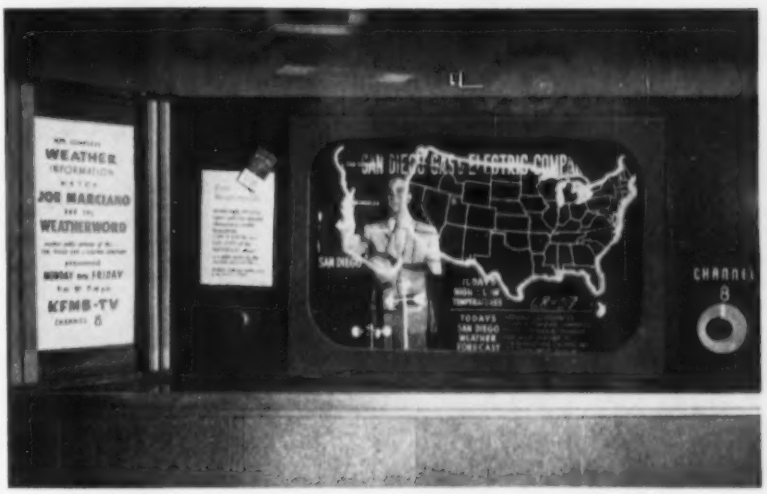


This window display at the downtown headquarters of San Diego Gas & Electric Company calls attention to the company's "Weatherword" television show, and also offers up-to-the-minute weather information. The window simulates the novel setting in which Meteorologist Joe Marciano appears on "Weatherword."

Five nights a week, some 348,700 San Diegans pause for five minutes to watch a local television show that combines honest-to-goodness public service with effective advertising.

The show: "Weatherword."

The sponsor: San Diego Gas & Electric Company.

The product we sell: Better living!

Ratings, response, *results* have convinced us that a television weather show is made to order for telling the utility story . . . and for stimulating sales of the products offered by dealers.

The weather has universal appeal—everybody talks about it . . . everybody is interested in it. Weather conditions have a direct bearing on many of our advertising campaigns — air conditioning, for example. And the show offers unlimited opportunities for tie-in support to other segments of the power industry. In recent months we have supplied electrical dealers with free copies of an official Weather Guide, indorsed by the "Weatherword" meteorologist. To date, more than 20,000 copies have been distributed to customers.

The weather works for us. Perhaps it can work for your company, too.

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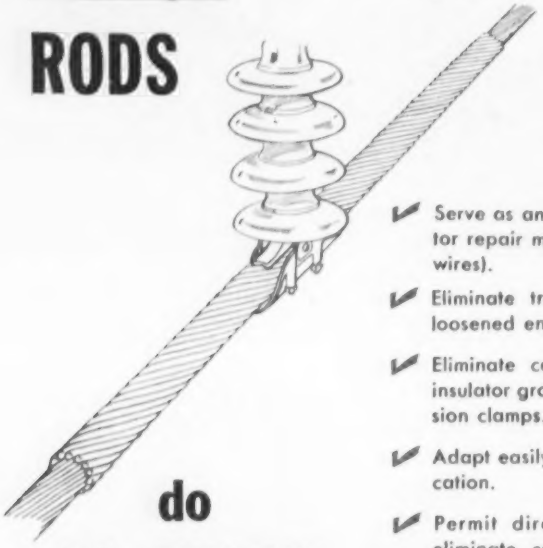

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and public utility districts must do their share in providing their own power resources."

## Puget Sound Sells Lines To City of Ellensburg

The city of Ellensburg, Wash., has voted to bring into the municipal power system some distribution lines owned by Puget Sound Power & Light Co. in areas recently annexed by the city.

The city council approved the purchase and voted to sell bonds to finance the $151,075 cost.

Transfer of ownership takes place July 1 if the state public service commission okays Puget Sound's application to sell the lines.

Ellensburg buys power from Bonneville Power Administration and distributes it over its own lines.

## PG and E Voltage Drops As Plane Clips Lines

A low-flying Navy plane snapped two cables in a Pacific Gas and Electric Co. 220-kv power line May 3, causing a 20-minute power interruption in San Francisco and the suburban Peninsula area.

There was a voltage drop in San Francisco and parts of the Peninsula and in some suburban areas the power was off.

Lights dimmed, trolleys stopped, household appliances were burned out and auxiliary motors in a San Francisco power plant were affected, knocking out the plant.

The break occurred in 61-strand all-aluminum cables straddling Niles Canyon in the East Bay area.

## Chelan PUD Bid Opening To Be Held Mid-June

Bids for final-stage construction of the Rocky Reach hydroelectric project on the Columbia River have been called by the Chelan County PUD, for opening June 14 at Wenatchee, Wash.

Two contracts will be awarded, one for the general work, the other for the electrical.

The general contract involves above 550,000 cu yd rock excavation, 750,000 cu yd of concrete and the installation of equipment, including seven turbines of 140,000-hp capacity and 12 50x58-ft taintor gates.

Placement of concrete has just begun on first-stage construction by Rocky Reach Dam Builders, a combination of four contractors. The first-stage contract involves construction of the seven easterly spillways.

SHELL

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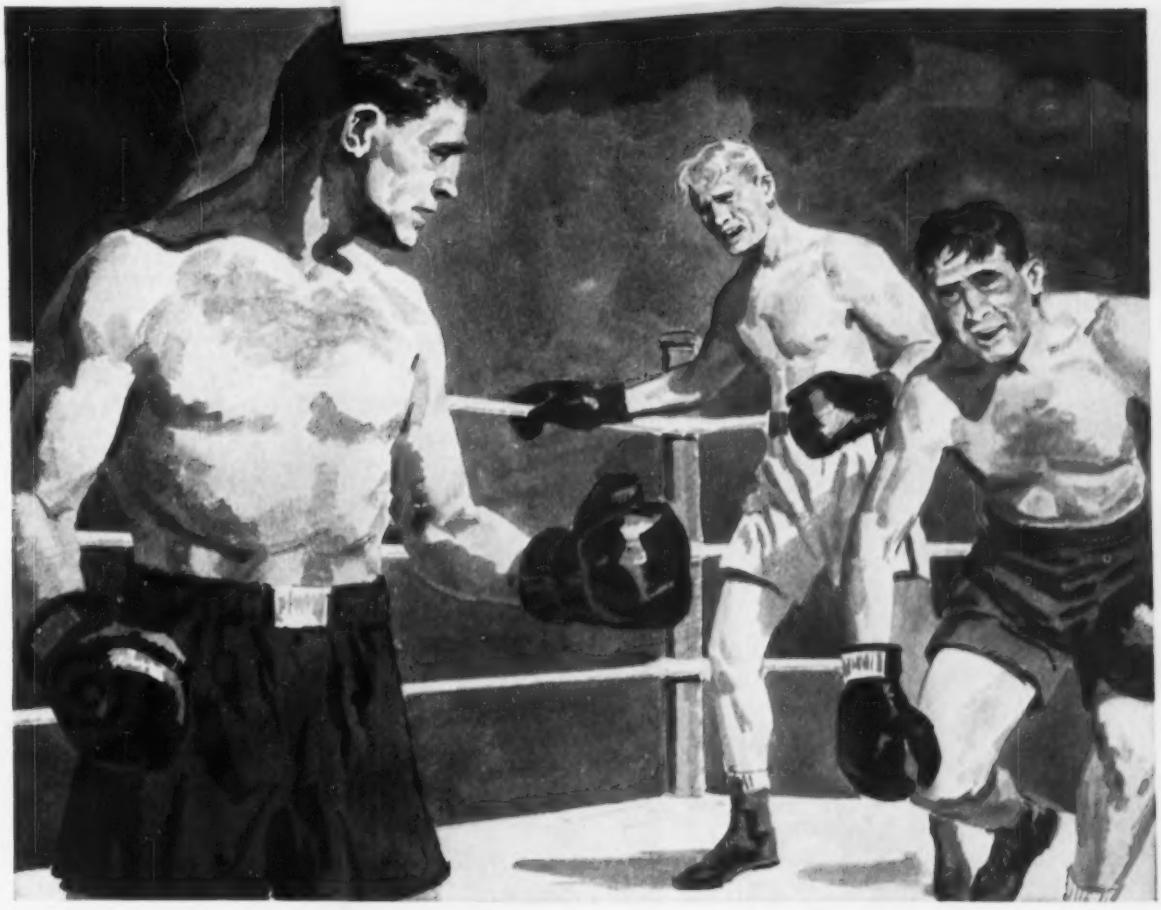

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**Basic Manual** includes complete instructions on use of system, estimating procedure and installation standards.

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**Advantages.** Here's what contractors say about Estimatic:

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*"Pays for itself in time saved alone"*

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**To ELECTRICAL WEST's Kilowatt-hour Contest Editor**
**68 Post St., San Francisco 4, Calif.**

**Here's My Forecast**

The annual kilowatt-hour output for the 11 Western states for the year 1957 will be ..... kwh.

Here's why (in 25 words or less). .....

Name .....
Title or job .....
Company .....
Address .....
City .....
State .....


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City .....
State .....

# Announcing

# A New Annual Load Forecasting Contest

# West's Kilowatt-hour Load Forecasting Rodeo

## A Chance To Put Your Brand on a $500 Block of Stock of a Western Utility

***The Object*** — To forecast the total kilowatt-hour output of the power stations in the 11 Western states for the year 1957. Federal Power Commission figures of kilowatt-hour output will be the basis of judging the winner. Winner will be announced in the April 1958 issue of ELECTRICAL WEST.

***The Contestants*** — Any person employed in any segment of the electrical industry in the 11 Western states, Hawaii or Alaska may submit one entry in the contest—using the attached postcard or a reasonable facsimile thereof. Entries must be postmarked not later than June 30, 1957. Employees of the McGraw-Hill company and its subsidiaries are ineligible to participate.

***The Prize*** — ELECTRICAL WEST will award the winner, who comes closest to the actual official FPC kwh output figure, $500 worth of common stock in one of the electric companies serving an area of the 11 Western states. The electric utility whose common stock will be the prize will be determined by a drawing held at the annual Pacific Coast Electrical Assn. convention in San Francisco, Calif., May 15-17, 1957. Stock representing the prize will be purchased immediately after the drawing and held in escrow with any accrued dividends until the winner has been determined. In case of ties, the prize will be divided equally between those submitting the winning figure.

***A Hint*** — In 1956 the official kilowatt-hour output figure for the 11 Western states was 113,501,734,000 kwh as reported by FPC.

If card is missing, use facsimile on opposite page.

**It's Fun — it's a game of skill — and a test of your optimism about Western growth. Calculate what this figure will be for 1957! It costs nothing to enter the contest. Just send in your estimate on the attached card, by letter or other postcard.**

**To ELECTRICAL WEST's Kilowatt-hour Contest Editor**

**Here's My Forecast**

The annual kilowatt-hour output for the 11 Western states for the year 1957 will be ..... kwh.

Here's why (in 25 words or less). .....

.....

.....

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Name .....

Title or job .....

Company .....

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## New Underground System Started By B. C. Electric

A new $6,000,000 underground high-voltage electric network will link three major British Columbia Electric Co. substations in Vancouver and suburban Burnaby to the main power lines feeding the greater Vancouver area.

Installation of the cables has started. They will carry energy at 230 kv and will connect with 230-kv overhead power lines originating at Horne-Payne and Ingledow substations in Burnaby and Surrey.

The underground circuits will run 21.1 miles to Newell substation in Burnaby; another 6.1 miles to Mainwaring substation in South Vancouver, and then 3.4 miles from Mainwaring to Kidd substation on the shore of the Fraser River.

## Edison Speeds Expansion To Meet New Demands

Southern California Edison Co. will require more than $180,000,000 of new money in 1957 and 1958 to finance a sharply accelerated construction program, Edison President Harold Quinton declared recently in an address before the New York Society of Security Analysts.

This would be in addition to the recent $37,500,000 bond issue.

Common stock will be issued "sparingly and reluctantly, if at all," the Edison president said, adding: "For the balance of this year our present intention is to issue additional bonds, and probably a preferred stock."

Southern California Edison expects to add about 75,000 new meter connections in 1957, Quinton pointed out—equivalent to the addition of an entirely new community with a population of roughly 200,000. Even this impressive figure, however, is not quite up to the record of 87,000 new meters in 1955, or the 83,700 in 1956.

## PP&L to Construct Two Substations

Pacific Power & Light Co. has started construction on two large electrical substations near Casper, Wyo., costing more than $1,000,000.

One of the substations will be Wyoming's largest. It will be equipped with two transformers. One will have a maximum capacity of 83,333 kva and reduce voltages from 161,000 to 115,000 v. Another transformer will have a maximum rating of 50,000 kva and will reduce voltage from 115,000-69,000 to 12,000 v.

The big substation will be a terminal point on Pacific's 161,000-v Casper-Yellowtail Dam-Billings line now under construction. It will also be linked with the new coal-fired Dave Johnston steam electric plant being constructed at Glenrock, Wyo.

## Calectric's New Plant Producing Electricity

A civic leader long associated with the growth and development of San Bernardino County, James A. Guthrie, May 3 opened a valve to start up the first 60,000-kw unit at California Electric Power Co.'s new San Bernardino steam electric generating plant.

The ceremonies marked another milestone in Calectric's electrification of large portions of San Bernardino County, which started in 1912 when the company first brought power to the desert via a 236-mile transmission line from hydroelectric plants in the High Sierra.

Participating with Guthrie in the ceremonies were: S. Wesley Break, chairman of the San Bernardino County Board of Supervisors; Raymond Gregory, Mayor of San Bernardino; Carl C. Ernst, Calectric vice-president and general manager. Other Calectric personnel and representatives of the Fluor Corp., international construction firm which built the unit, also took part.

## Wyoming Municipals Fight Property Tax

The 15 Wyoming towns that own their electrical systems are trying to get them exempt from property taxation.

The 1957 Wyoming legislature, in implementing a constitutional amendment adopted in 1956, enacted a bill exempting all county and school district property and certain itemized city property from taxation.

Electric systems were not specifically exempt from taxation in the bill.

However, representatives of the towns argued before the state board of equalization that the law gave the board authority to exempt other city property used for "governmental purposes." The representatives of the municipalities argued that furnishing of electrical energy could be considered a "governmental purpose."

Walter Hudson, chairman of the state board of education, said an attorney general's opinion would be sought before a decision is reached.


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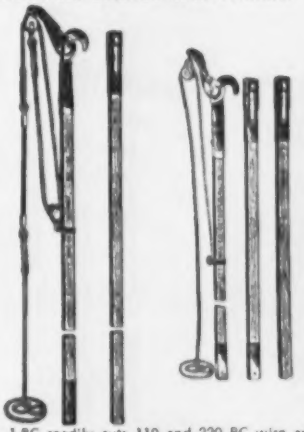
No. 1-WJ Jointed Tree Trimmer



No. 1-BC readily cuts 110 and 220 RC wire and can be used safely for cutting hot 4800 volt primary and service wire when hanging near ground. Has 12" Bakelite insulator. Two 6 ft. pole sections make operation from ground easy.

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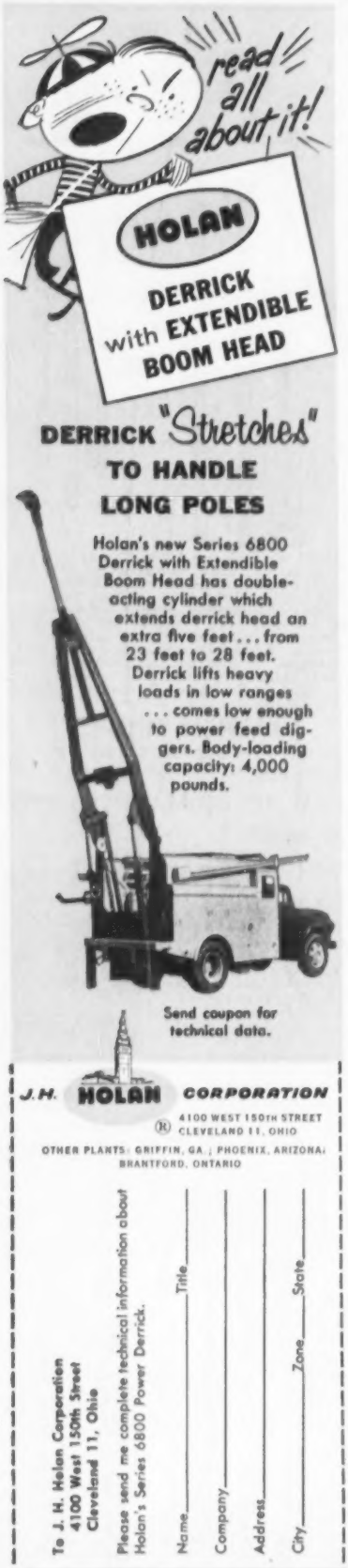
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State

## Tax Bill of PG and E Breaks All Records

California's largest property taxpayer, Pacific Gas and Electric Co., has made final payments on its 1956-1957 local property tax bills. The $50,413,000 total is the largest property tax bill ever paid in the state.

The record amount has been distributed among 197 California cities, 49 of the state's 58 counties, and more than 3,300 towns and districts.

Increases in almost all major classifications brought PG and E's total tax bill for 1956 to a record $125,900,000, highest figure in the company's history, exceeding 1955, the previous record year, by $5,500,000.

Taxes continued as the company's largest single item of expense, absorbing 25.3c out of every dollar received from all sources, according to Norman R. Sutherland, PG and E president and general manager. The tax bill was substantially more than double the total of wages and salaries paid to the company's operating employees, he said.

## PP&L To Build 41-Mile, 230-kv Line

Pacific Power & Light Co. will build a 230-kw transmission line between its Swift project on the Lewis River in southwest Washington and the Portland area, a distance of about 41 miles.

Earlier Bonneville Power Administration had included a request for funds to build transmission facilities in its budget requests for the coming fiscal year, but it has eliminated the request.

PP&L's decision to build its own line was made after board studies indicated the line should be built. Right-of-way is now being acquired and construction and completion scheduled for 1958.

The PP&L Swift-Portland line will tie in with the BPA transmission grid at Troutdale and, if extended south into the Willamette Valley, also at Albany.

## Santa Suzana Reactor Goes Critical

Atomics International's sodium reactor, one of several Atomic Energy Commission experiments aimed at finding an economic way to generate nuclear power, has produced for the first time self-sustaining nuclear fission. It is first sodium-cooled thermal reactor to reach this stage.

No electricity was generated at first, but power level of the reactor will be boosted gradually. It is designed to reach a level of 20,000 kw of heat, enough to generate 6,500 kw of electricity for Southern California Edison Co., who will purchase the heat.

The SRE, an experimental civilian project based at Canoga Park, Calif., uses neutrons moderated with graphite to sustain the fission process. Liquid sodium is circulated through the reactor core to remove heat produced by atomic fission.

## Seattle To Vote On 50 Miles of Lighting

Seattle will vote at the next municipal election on a bond issue to finance installation of improved lighting systems on 50 miles of arterial streets if the city council accepts the recommendation of E. E. Lewarch, city traffic engineer.

Safety lighting on about 350 miles of streets, paid for by a previous bond issue, has reduced night accidents substantially, Lewarch said May 15 in his annual report. The additional 50 miles are in areas recently annexed to the city.

Lewarch proposes that cost estimates be made for installing mercury-vapor or fluorescent lighting on the new arterials.

• The Seattle City Council is expected to approve a year's extension of an agreement between Seattle City Light and the University of Washington for research in computing methods. The extension has been requested by Paul J. Raver, City Light superintendent, at a cost of $16,000. City Light staff members have been working with the University faculty for the past two years on the development of new methods for using mechanical computers in the power field. The project so far has cost $31,000.

• Shareholders of the Salt River Water Users Assn. have approved a $10,000,000 bond issue to finance completion of a second 100,000-kw steam generating unit at the Salt River Power District's new Agua Fria plant. An initial 100,000-kw unit recently was placed on the line. Victor Corbell, project president, said negotiation of the bond issue will be started soon.

• **Pacific Power & Light** Co. crews now are using the firm's new $250,000 service center building at Kalispell, Mont. R. R. Gordon, district manager for PP&L, said that, although construction of the new center is complete, landscaping work still is underway.

# DUAL VOLTAGE transformers

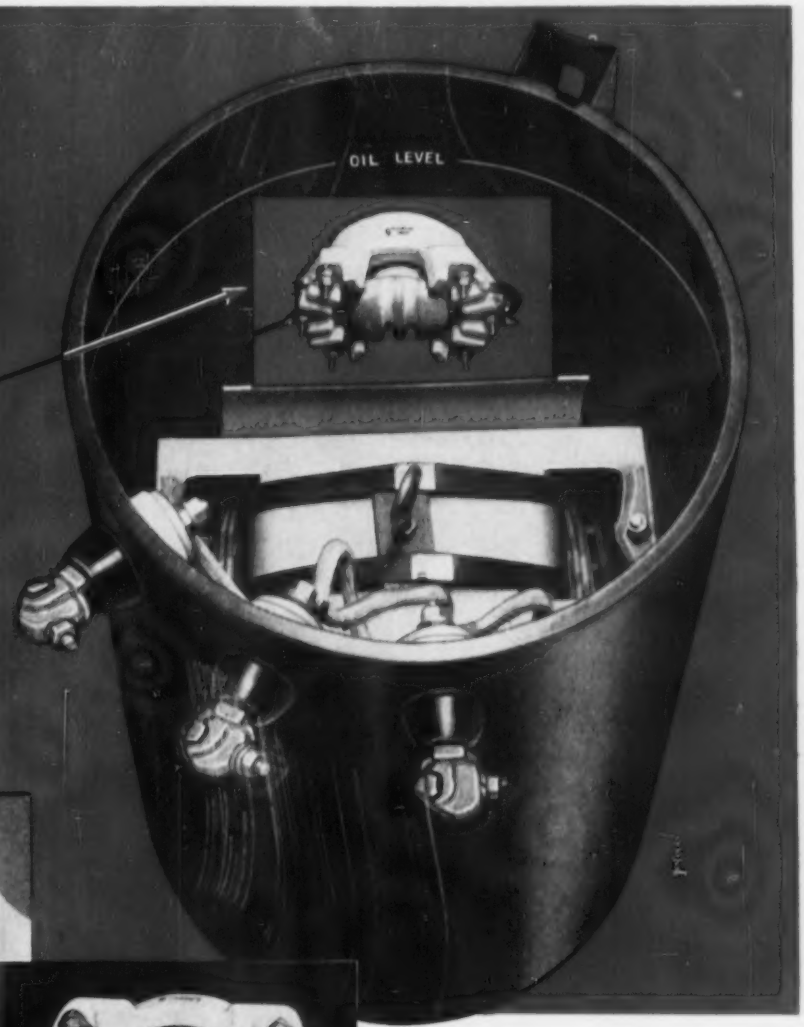
## MEAN SAVINGS IN MONEY, TIME, LABOR

You save in stocking requirements . . . one unit can be stocked where it now takes two.

You save transformers from obsolescence when system voltage is increased.

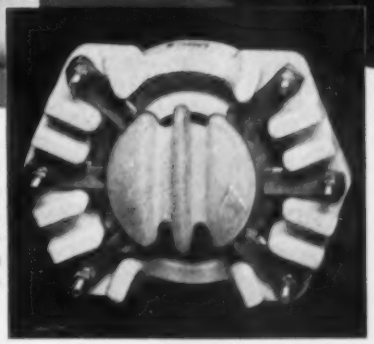
You save on change-over, cutting both down time and labor time.

Voltage change-over switch is mounted on the inside of the tank, under the oil level. It is fully operable from outside the tank.




Switch is sealed and protected from damage by removable screw cap and neoprene gasket.

Simple operation! Remove screw cap and reverse, using cap as handle for rotating switch.



Switch is rotary-bridging-to-position type, with both positions clearly identified by a stamped plate on the switch. Body constructed of wet process electrical porcelain with ample creepage. Fully impulse tested by NEMA standards.

For positive protection against puncture, flashover, or lightning failure the entire transformer is always insulated for the basic insulation level of the highest name plate voltage.

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| Available in | 2400 x 4800 volt<br>2400 x 7200 volt<br>4800 x 14,400 volt<br>7200 x 14,400 volt | from 10 through 100 KVA. |

Like all RTE Transformers, dual voltage models are backed by a five year guarantee. They are available from conveniently located warehouses throughout the U.S.

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ACCURATE MANUFACTURING CO.
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## NWPPA at Tacoma

(Continued from page 156)

tric). In this latter connection, a paper by Robert Willis of the Clark County PUD described the benefits of accumulating and maintaining accurate feeder load records. Such records aid in predicting feeder performance, aid in determining correct loading practices for major substation equipment and provide other essential data that will improve both customer service and system performance.

The book containing the papers of all speakers, plus an attendance list and a printed program, was prepared by Norwood who contacted speakers in advance asking them to deliver 250 copies of his paper at the registration desk on arrival. His instructions included format and style for the papers.

After lunch the first day the attendance list was mimeographed and sent to a Tacoma print shop with the papers, printed programs and covers. The printer stapled the entire workshop proceedings, trimmed the papers, taped the back and delivered the books early in the afternoon of the second day.

### Northrup Elected

The meeting saw the election of Carroll Northrup, operating superintendent of the Franklin County PUD, Pasco, Wash., as new chairman for the section, to succeed Robert Gillette of the Grant County PUD, Ephrata, Wash. Decision was reached to hold next year's workshop in the Portland area.

Robert R. Ries, engineer with the Grant County PUD, received the Milton H. McGuire Award for "outstanding engineering achievement." The award was based on the work he has done in preparing the PUD system for anticipated heavy loads when Priest Rapids Dam goes into power production. Ries' work has included development of a means to increase transformer loads on utility poles.

The two days were devoted to presentations by the various committees of the section—safety, engineering administration, communications operating practices, substation operating practices, distribution operating practices, and meter and relay operating practices.

Prof. John Engle of Oregon State College announced that the fifth annual electric meter school sponsored by the association would be held Sept. 16-20 at Corvallis.

# NEWS ABOUT PEOPLE

Beale

## Homer Beale Gets New PP&L Post

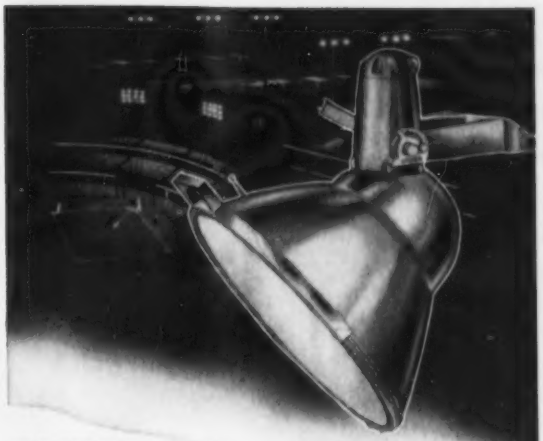
Homer Beale, former district manager at Walla Walla for Pacific Power & Light Co., and since June 1956 an acting assistant general manager for districts in eastern Washington and Oregon and Idaho, has been named an assistant general manager.

Beale and Assistant General Manager D. B. Leonard, who has been on special assignment since last June, will share the direction of district managements in what Vice-President and General Manager George T. Bragg described as a realignment of responsibilities to strengthen the PP&L organization to permit more effective aid to district managers in the area.

Beale will have charge of the districts of Walla Walla and Dayton, Wash., Pendleton and Enterprise, Ore., Kalispell, Mont., and Sandpoint, Idaho. Leonard continues in charge of the districts of Yakima and Sunnyside, Wash., The Dalles, Hood River and Deschutes, Ore.

• **George W. O'Connor,** head of the O'Connor Construction Co. of Fromberg and widely known former state legislator from Carbon County, has joined Montana Power Co. as executive assistant.

• **Lowell Gamble,** director of the utilities department of the Wyoming Public Service Commission, has resigned to accept a post with Montana-Dakota Utilities Co.

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"Series 4000" Floodlights meet NEMA specifications and are available in a variety of beam patterns and with mounting provisions for every application. Write for complete details—See how Steber features provide better lighting at lower cost.

Other Steber Series of floodlights—open and enclosed types from 100 to 1500 watts, are available in deluxe and economy models.

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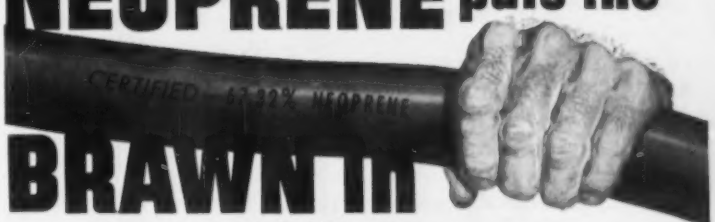


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It's the bonus quantity of Neoprene—67.32%, certified by a registered professional engineer—in the outer protecting jacket that gives Bronco 66 Certified its extra toughness, greater resistance to oil, ozone, sunlight, makes it more flameproof, more resilient and flexible.

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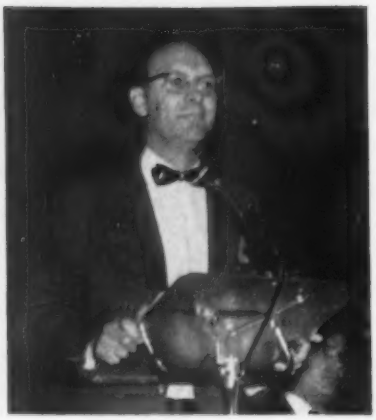

Simpson

## Black Hills P&L Makes Executive Changes

Four changes in executive positions were voted by directors of Black Hills Power & Light Co. at a meeting in Rapid City, S. D., April 17.

J. B. French, president of the firm and its predecessors since 1937, was elected chairman of the board. He is also chairman of the executive committee of Southern Colorado Power Co. French will devote a substantial part of his time to long-range planning and development of the company's subsidiary, Wyodak Resources Development Corp.

Neil G. Simpson, who has been with the organization since 1937, was elected president. He was made a vice-president in 1941, elected to the board of directors in 1946 and became general manager in 1950.

H. E. Norman, an employee since 1921, was elected vice-president and treasurer. He has been treasurer since 1954.

L. Duane Walrafen, who joined the company as corporate officer Feb. 1, 1956, was elected vice-president and secretary.

R. G. Asheim, who began work for the company in 1944, was elected vice-president in charge of operations. Asheim has been manager of engineering and operations since 1954.

• **Harry Z. Babbitt** has been appointed chief engineer, a new position, and Joseph Munro has been promoted to production superintendent by Black Hills Power and Light Co. Babbitt will be responsible for research and development in the company's immediate and long-range planning. Munro will be in charge of the firm's generating plants.

• **J. Harold Cash** of Kaycee, president of the Wyoming State Rural Electric Assn., has been named to the advisory council serving David A. Hamil, national REA administrator.

• **E. A. "Dal" Grauer,** president of British Columbia Electric Co. Ltd., Vancouver, B. C., has been elected by acclamation as Chancellor of the University of British Columbia. Dr. Grauer is a former B. C. Rhodes scholar and a member of the Board of Governors of the University.

Breckenridge

• **Harvey K. Breckenridge** has been named to head up the new office of Ebasco Services, opened recently in San Francisco. The new office, located at 120 Montgomery St., will be headquarters for a staff of consultants who will serve clients located in the Western region of the U. S. Breckenridge is a graduate of Columbia University and has had wide service in the electrical industry. He joined Ebasco in 1954.

• **Ernest W. Hatch,** Moscow, Ida., district manager for Washington Water Power Co., has been appointed Lewiston division manager. He will succeed Albert Gruber, who has been named technical research analyst for WWP with offices at Spokane.

• **J. Stuart Don,** who joined British Columbia Electric Co. as a laborer in the coke department of the gas division in 1940 and 14 years later was named employment supervisor, has now become labor relations officer. In this capacity, he will assist labor relations manager Morley Fox.

• **J. T. Kirkpatrick** has been appointed chief engineer of the new

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ADDS YEARS TO BALLAST LIFE

## the first major development in Ballast design since the introduction of the fluorescent lamp

incorporating a thermally actuated protective device that gives longer ballast life

ADVAN-guard, an integral part of the new Advance Ballast design, adds years to ballast life by preventing ballast operation at abnormal temperatures. ADVAN-guard protects against excessive voltage supply . . . internal ballast short circuiting . . . inadequate lamp maintenance . . . improper fixture application . . . and eliminates the need for individual fixture fusing.

ADVAN-guard is pre-set to instantly and automatically "trip-out" when the ballast is operating at higher than recommended temperatures. When heat decreases to normal temperature ADVAN-guard resets automatically and the ballast resumes operation. If overheating continues . . . ADVAN-guard protection continues. ADVAN-guard, by maintaining normal operating temperatures, increases the life of a fluorescent lamp ballast.

For longer ballast life insist on Advance quality fluorescent lamp ballasts with ADVAN-guard protection.

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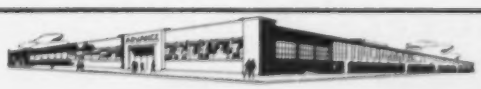

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Many companies have standardized on States Test Switches because:

1. No live parts extend beyond base —an important feature.
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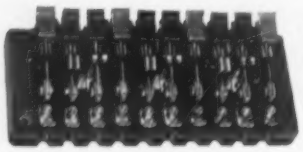

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Provides easier, safer gripping. New handle mounted on States exclusive angle blade gives sufficient jaw contact.

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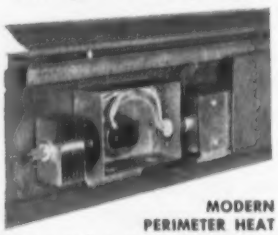
**HEATSUM ELECTRIC BASEBOARD**

(Illustration of cut-a-way section)



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100,000-hp Georgia generating station of British Columbia Power Commission at Bare Point, Chemainus. The plant is expected to go into operation by mid-August.

Ingledow

• **Tom Ingledow**, vice-president and executive engineer of British Columbia Electric Co., has been appointed a member of the Defense Board of Canada for a three-year term. The appointment gives national recognition to an active career in the electrical-construction field during the last 17 years he has been with B. C. Electric.

## Robert Person Elected To Directorship

Robert T. Person, vice-president of Public Service Co. of Colorado, was elected to the board of directors at the annual meeting of shareholders.

Person, vice-president in charge of advertising and publicity since April 26, 1956, was elected to succeed F. L. Witsell who died in June 1956.

A graduate of University of New Mexico, Person started in the electric utility industry in 1934 with Albuquerque, N. M., Gas and Electric Co. He was commercial superintendent of Trinidad, Colo., Electric, Transportation, Railway and Gas Co. from 1937 to 1940.

He went to Pueblo, Colo., in 1940 to become commercial manager of Pueblo Cas & Fuel Co. He became vice-president and general manager in 1947 and held that position until he joined Public Service Co. Sept. 15, 1953, as manager of advertising and publicity.

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Single Phase - 60 Cycle

3 KVA to 75 KVA
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Cooper

• **Lloyd E. Cooper** was elected vice-president of California-Pacific Utilities Co. by the board of directors at a recent meeting in San Francisco. Cooper, who has been gas engineer and rate engineer for the company for three years, will continue to be responsible for engineering and operating problems related to gas operations. He also will direct negotiations in connection with purchased power and purchased gas rates.

## Hofacker and Cromer Win Promotions

The retirement of a long-time employee of Montana Power Co., and promotions of two other men from the engineering department have been announced by J. E. Corette, president and general manager.

George Nelson, purchasing agent since 1942, has requested to be retired Jan. 1. He will be succeeded by Roger A. Hofacker, a graduate of Montana State College in 1939 and an employee of the utility since that time.

The promotion, effective immediately, of John W. Cromer, a 1934 graduate of Montana State College, from distribution engineer to assistant superintendent of transmission and distribution also was announced by Corette.

"We appreciate the service George Nelson has given Montana Power and accept with regret his application for early retirement," said Corette.

• **Walter W. Howell** and **Donald J. Miller** were elected assistant vice-presidents of Public Service Co. of Colorado. J. E. Loiseau, company president, said the appointments ex-


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pand the administrative assignments at the executive level, made necessary by the company's growth.

## Salt River Power Realigns Sales Dept.

Three assignment changes have been announced by the Salt River Power District at Phoenix.

Frantz R. Lupton, formerly supervisor of marketing and sales, has been promoted to manager of the development and sales department.

E. K. Carpenter will assume duties of the newly created position of manager of the rates and analysis department.

F. E. Smith has been transferred from development and sales to contracts and special studies division of the rates and analysis department.

Mackenzie

● **George F. Mackenzie,** veteran of more than 40 years with Pacific Power & Light Co., has been elected vice-president and treasurer by PP&L's board of directors. He has been treasurer since 1950. The board at the same time elected Allan A. Smith, general counsel, to fill an existing vacancy on the board of directors. Smith heads the law firm of Smith, Gray, Hill & Rodgers.

● **Recent engineering** department changes at Portland General Electric Co. affect W. D. Smith, who was made chief of the planning branch; P. A. Stangell, who became chief of the electrical design branch; R. D. Palmer, new chief of structural design, and Sidney E. Caldwell, named assistant chief system engineer. Before their promotions Smith was electrical design engineer, Stangell assistant electrical design engineer, Caldwell planning engineer. Palmer has held various engineering posts since he joined the firm in 1924.

Davis

● **Dr. John Davis,** a senior economist on the Gordon Royal Commission staff, has been appointed director of British Columbia Electric's department of research and planning. He takes over these duties from Dr. L. B. Jack, who in future will concentrate on long-range budget programs for the public utility.

Scarff

● **Donald D. Scarff** has been named Western region sales manager for General Electric's large lamp department. Until his present appointment he was manager of the department's Pacific sales district. Under Scarff now are sales districts of Denver, Los Angeles, Oakland, Portland and Seattle. He will headquarter in San Francisco.


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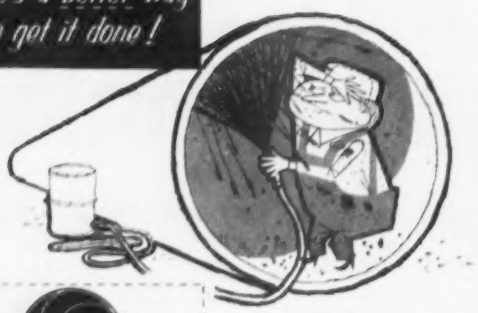

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For new construction and maintenance—Everstick Anchors speed up work and provide dependable anchorage on all types of jobs. Made of resilient, rust resistant malleable iron. The toughest anchors made. Write for bulletin.

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100 AND 200
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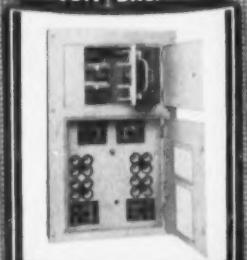

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The WADSWORTH Electric MFG. CO. INC.
COVINGTON, KENTUCKY

WRITE FOR NEW FREE CATALOG

# NOTES ON THE TRADE

Lehl

• **Schwager - Wood** Corp., Portland manufacturer of high-voltage switchgear and other allied products for the electric power industry, announced the appointment of Henry George Lehl as national sales and marketing manager. Lehl fills the newly created position after extensive experience in the utility and electrical field in the Pacific Northwest during the last 20 years. Starting with Portland General Electric in 1936, he subsequently became district supply and apparatus sales manager for General Electric Supply Co. and most recently was managing partner of the Lehl Supply Co. at Pasco, Wash.

• **Appointment of** two new distributors in Oregon and Nevada and a new certified service shop serving areas in Wyoming and South Dakota has been announced by Allis-Chalmers Industries Group. The Industrial Electric Service Co., 1520 N. E. Stephens St., Roseburg, has been named a distributor for motors, control, transformers and "Texrope" V-belt drive equipment in Douglas and Josephine Counties in Oregon. The Pavell Electric Supply Co., 1025 South First St., Las Vegas, has been appointed a distributor for Allis-Chalmers motors and transformers in Clark and Lincoln Counties in Nevada. The Industrial Electric & Supply Inc., 2330 West Main St., Rapid City, has been named a certified service shop for Allis-Chalmers motors, control and transformers in two Wyoming and 8 South Dakota Counties.

Shelley

• **Leonard P. Shelley** has been elected a vice-president of Federal Pacific Electric Co. Shelley joined FPE in 1948 as manager of the Los Angeles district. He was named Western regional manager in 1950, which he has held until this promotion.

Eisler

• **Kaiser Engineers** announced that Max Eisler, power and industrial equipment installation specialist, has joined the company's engineering division as a principal engineer. Eisler has been with General Electric, Buenos Aires, Argentina, for the past 20 years, and has been in charge of the electrical apparatus department for the last 10 years.

• **Electro-Pulse** Inc., manufacturer of pulse equipment and electronic counters, announces the appointment of the Gene French Co. of Albuquerque, N.M. as its exclusive sales representative in the Utah-Colorado-New Mexico area.


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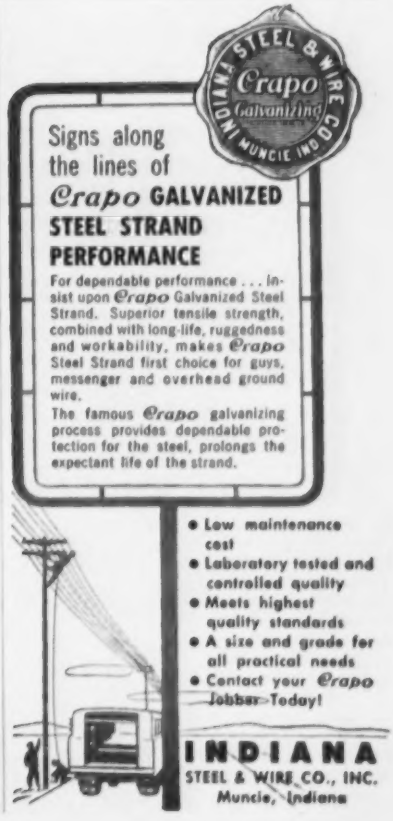
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INCANDESCENT RLM SPECIFICATIONS
FLUORESCENT RLM SPECIFICATIONS
ABOLITE LIGHTING DIV.
APPLETON ELECTRIC CO.
BENJAMIN ELECTRIC MFG. CO.
DAY-BRITE LIGHTING, INC.
EASTERN FIXTURE CO., INC.
ELECTRO SILV-A-KING CORP.
ENDER-MONARCH CORP.
FLUORESCENT FIXTURES OF CALIFORNIA
GLOBE LIGHTING PRODUCTS, INC.
THE EDWIN F. GUTH CO.
KEYSTONE ELECTRIC MFG. CO.
THE MILLER CO.
MITCHELL LIGHTING CO.
MULTI ELECTRIC MFG., INC.
OVERBAGH & AYRES MFG. CO.
QUADRANGLE MFG. CO.
THE RUBY LIGHTING CORP.
SMITHCRAFT LIGHTING DIV.
SMOOT-HOLMAN CO.
SPERO ELECTRIC CORP.
SUNBEAM LIGHTING CO.
SYLVANIA ELECTRIC PRODUCTS, INC.
WESTINGHOUSE ELECTRIC CORP.
WHEELER REFLECTOR CO.
WORK-O-LITE CO.
D-1, 2, 3 — 8–15% uplight
SD-1 — 20-30% uplight
O — Open End
C — Closed End
*Aluminum Reflectors all others are Porcelain Enamel
Note: Many manufacturers make incandescent RLM Units for more than one lamp wire. The numerals refer to the number of different-size RLM Units which the manufacturer offers under the specification.

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R-1553

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The letters RLM stand for Reflector and Lighting Equipment Manufacturers

• **General Electric Co.** has started construction of a $500,000 plant at San Jose, Calif., for manufacture of nuclear fuel elements for atomic power generators. First project will be development and assembly of fuel elements for Commonwealth Edison Co.'s new Dresden nuclear power station which G-E is building near Chicago. Completion of the new 32,000-sq-ft fuel manufacturing building is scheduled for December. A 15,000-sq-ft nuclear fuel development facility was completed last year.

• **Construction is underway** at Compton, Calif., on an ultramodern manufacturing and repair plant for Westinghouse Electric Corp.

Walter J. Maytham, Pacific Coast vice-president for Westinghouse, said the concrete and steel building will be ready for occupancy Nov. 1, 1957. It is rising on a seven-acre site near the Long Beach Freeway at 18020 S. Santa Fe Ave., in the Rancho San Pedro industrial area 10 miles north of Long Beach.

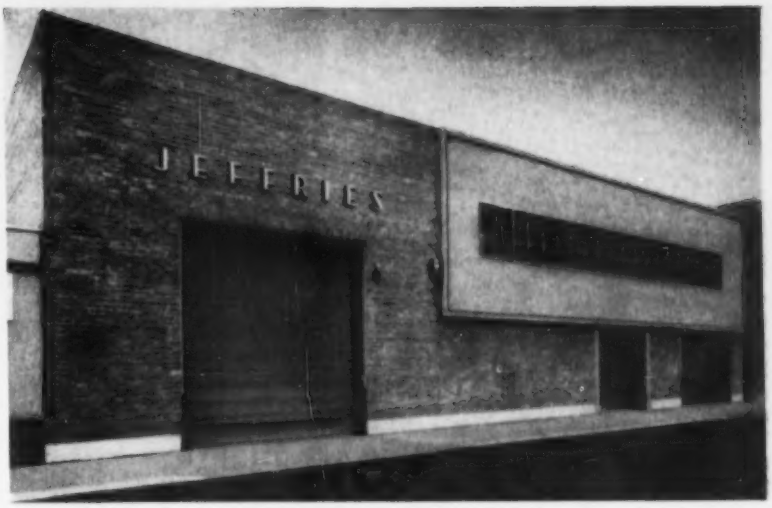
The building will provide 80,000 sq ft of plant area and 8,000 sq ft of office space. It will replace the present manufacturing and repair plant at 3383 E. Gage Ave., Huntington Park.

• **Universal Mfg. Corp.,** manufacturer of a complete line of fluorescent ballasts for residential, commercial and industrial use, has announced the opening of its Western regional sales office and distribution warehouse in Los Angeles. The new Universal office is servicing its customers in California, Washington, Oregon, Mexico, Western Canada and the Far East. George J. Kaufman, who has been affiliated with the company for six years, has been appointed regional manager.

• **Fluorescent Fixtures** of California announces a new addition to its quality line of fixtures. Under license agreement with Smoot-Holman Co., Inglewood, Fluorescent Fixtures will manufacture the "Perfect Vision" luminous indirect luminaire under the All-Brite label.

• **R. D. Payne** was recently appointed electric utility application engineer for General Electric Co.'s Apparatus Sales Division in Denver. Payne, a graduate of the University of Missouri, joined General Electric in 1947.

• **Glenn Dick Equipment Sales Inc.,** Boise, has been appointed a sales, parts, and service dealer for Four Wheel Drive Auto Co. trucks in central and southern Idaho.




**Pictured is the new home of the Jeffries Transformer Division of Zinsco Electrical Products, Los Angeles. The factory and engineering building has 28,000 sq ft**

• **Campbell & George Co.** is the new sales representative for Hill Transformer Co., San Carlos, Calif.

Ward

• **J. Frank Ward** has opened offices in Seattle, 927 Smith Tower, as utility system consultant, covering problems of power supply planning, system development and advance planning. For the past three years, Ward has been managing director of the Washington State Power Commission, now dissolved by state law passed at the 1957 legislature. Prior to this, Ward was superintendent of Tacoma City Light for seven years, and he has also been connected with the Bonneville Power Administration in general administration particularly related to utility system power supply and service problems.

• **Carl L. Wood** has been assigned to the position of assistant manager, Foothill Electric Corp., Oakland, a nation-wide electrical contracting firm.

• **James Fletcher,** assistant Pacific district manager, General Cable Corp., has been appointed to the position of representative of all subsidiary companies on the Pacific Coast. Fletcher has been elected vice-president of Clifton Conduit Corp.; General Insulated Wire Works Inc.; New England Cable Co., and Alphaduct Wire and Cable Co. He will make his headquarters in San Francisco.

**Federal Pacific Electric Co. brings "the mountain to Mohammad" in introducing its new type DST air circuit breakers to utility men and consulting engineers in the Western states. By using this weather-protected truck, this indoor unit can be demonstrated right at field or downtown offices**

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# PROFILES

A. B. Couch (right) recently became residential sales director of Puget Sound Power & Light Co.'s general sales and commercial departments. He formerly was Northern division sales manager, headquartered at Bellingham

At the EEI Sales Conference (below), Vice-president Ralph J. Phillips of San Diego Gas & Electric Co. accepts plaque for the company's winning entry in the lighting education awards. At left is George W. Ousler, chairman, EEI Awards Committee, and at right H. A. Stroud, chairman of the Better Light Better Sight Bureau, donor

Gov. J. Hugo Aronson recently signed a Senate Bill adopting the National Minimum Electrical Code for the State of Montana. He is shown at his desk with (from left) Senators Frank Reardon and J. Miller Smith, co-authors of the bill; LeRoy Halpine, Montana State Council, Electrical Workers, IBEW, Robert Burns, manager of Montana Chapter, National Electrical Contractors Assn.

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